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ABSTRACT

Research was conducted to determine: (1) the effects of a perceptual versus a symbolic modeling concept of a question categorizing system on the verbal behavior of student teachers; and (2) the effects subjects of this study have upon the question writing practices of students they instruct. Instruction regarding a modified Gallagher and Aschner questioning category system was presented to the experimental group via video tape, handouts, and discussion; the control group received no video taped instruction. Student teacher questioning behavior was audio taped and their students wrote questions. All questions were categorized and the resultant proportional values analyzed by chi square and Fisher's exact probability test. Results indicated that: (1) the perceptual model was not significantly more effective; (2) students modeled their student teachers; and (3) an impact was made by both methods of instruction on the questioning behavior of student teachers. Additional research was proposed to determine if these results hold in all disciplines and over long periods of time, and to learn if changes in the cognitive level of questions occur. (Author/LB)

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Final Report

Project No. 2-c-46
Grant No. OEG-3-72-0046

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# EFFECT OF A VIDEO TAPED MODELING PROCEDURE ON VERBAL QUESTIONING PRACTICES OF SECONDARY SOCIAL STUDIES STUDENT TEACHERS

April 14, 1973

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

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## PREFACE

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EFFECT OF A VIDEO TAPED MODELING PROCEDURE ON VERBAL QUESTIONING PRACTICES OF SECONDARY SOCIAL STUDIES STUDENT TEACHERS

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## ABSTRACT

This study was conducted to determine: (1) the effects of a perceptual versus a symbolic modeling concept of a question categorizing system on the verbal behaviors of student teachers; and (2) the effects subjects of this study have on the question writing practices of students they instruct.

Instruction regarding a modified Gallagher and Aschner questioning category system was presented to the experimental group via video tape, prepared handouts, and discussion, and to the control group through the use of prepared handouts, discussion, and other verbal means.

Student teacher questioning behavior was audio taped on five different occasions and students in two of their classes on three different occasions wrote questions based on controlled information. All questions were categorized and the resultant proportional values statistically analyzed by use of the chi square and Fisher's exact probability test.

The findings indicated that: (1) the use of the perceptual model was not significantly more effective than the symbolic model; (2) the students modeled their student teachers if the written responses are indicative of teacher influence; and (3) an impact was made by both methods of instruction on the questioning behavior of student teachers.

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# CHAPTER I

## PROBLEM AND HYPOTHESES

### Introduction

Teacher education programs evidence continuing need of specific data on which to base decisions regarding the most feasible way to design preservice programs. The need is especially evident in the area of providing instruction in specific teaching skills with anticipation of a significant degree of transfer to both the student teaching and the regular teaching assignments.

The earlier advent of instruments leading toward objective observation and analysis of the teaching act such as classroom climate and instructional skills, and the later development of a sophisticated technology such as sound films and audio and video tape recorders, have been combined to serve as compatible tools in teacher education programs (Allen and Ryan, 1969; Amidon, 1967; Bellack, 1969; Flanders, 1969; and Withall, 1967). The various observational instruments have been used in isolating the verbal and non-verbal aspects of the teaching act while video tape ensembles and other film media have served as means of capturing both the verbal and non-verbal interaction plus the various physical aspects of the teaching act and the teaching environment.

Analysis of both the verbal and physical aspects of the instructional act has produced evidence of teaching being a combination of several skill, attitudinal, and knowledge components. The identification of such components has encouraged teacher educators to arrange portions of their preservice programs so as to capitalize on available research relative to both the symbolic (written or printed) and perceptual (live or filmed) aspects of preparing teacher candidates.

A review of current preservice curricula in general, and social studies curricula in particular, show evidence of increasing concern regarding critical thinking, problem solving, inquiry, and levels of thinking. Massialas and Cox (1966:91) argue "that the conditions of the modern world require, more than ever before, the use of a method of inquiry that will yield reliable knowledge." The important business of social studies education thus becomes that of "decision making and the making of judgements of fact and value." This journey from doubt to supported conclusion, from one frame of mind to another, suggests the use of questions by the teacher and student as the inquiry process is initiated, developed, and concluded.

Goldmark (1968:1-8) indicates that "the popular concept of inquiry is the asking of questions in a search for answers." The questions arise from and are asked in a context or a special frame of reference and permit inquiry to expand and continue.

Sanders (1966:ix) states that "questions have always been the stock in trade of teachers." Cunningham (1971) reports that questioning is one of the teacher's most effective instruments for stimulating and guiding children toward independence in learning and thinking and that to this end the teacher's questions serve as a model.

Adams (1964:1) acknowledges that "effective teaching behavior is related to a number of variables, one of the most crucial ones, probably, being that of knowledgeable skill in the use of questions." Hunkins (1972) stresses the point that questions are central to learning and that good questions are part of whatever instructional strategy a teacher employs.

The studies by Gallagher and Aschner (1963), Taba (1964), Hunkins (1969), and Wood, Brown, Ober, and Soar (1969), indicate a reciprocal relationship between the cognitive level of the oral or written questions used by teachers and the level of thinking or achievement experienced by students in their classes. The Gallagher and Aschner levels of thinking have become a hierarchical category system used to structure instructional information and as a questioning category system. For descriptions of the categories, see pages five and six of this study.

Accepting the importance of teacher questions in developing critical thinking skills does not mean such is being realized. Cunningham (1971) reports that though most teachers have good intentions in their use of questions, the least common use was found to be that of stimulating thinking and the least common outcome being the ability to critically think. Rogers (1968) cites a study by Guzak as suggesting that teachers tend to phrase questions that require predetermined answers, the continuous use of which leads to curtailment for children to think critically.

If teaching is to be a helping rather than describing process then questioning does become, according to Tyson and Carroll (1970:21), "a valid tool for ordering and organizing experience . . . It is possible, through questioning, to direct the attention of students to relationships by which the diverse events in their world may be ordered and organized." Thus, an awareness of the types of questions and an opportunity to develop the question-asking ability becomes an important component of teacher education programs in general and social studies programs in particular.

While preservice teacher education programs are directly responsible for developing candidates who possess the skills necessary for success in the instructional environment, the ultimate concern

must be the long-range effect preservice programs have on the students taught by graduates of such programs. The impact of teacher education programs can not rest with the teacher candidates alone but must reach the students in the classrooms to determine if they are able to imitate the knowledges, attitudes, and skills that are modeled by their teachers.

## Statement of the Problem

The purpose of this study was to investigate in an undergraduate teacher education program: (1) the effect of two different treatment methods on the cognitive level of classroom questions asked by social studies student teachers after they have been subjects in an experimental treatment in pre-student teaching; and (2) the cognitive level of questions written by students taught by subjects of this study.

The thirty-six subjects who comprised the sample of this study were those students enrolled in Education 431, Methods and Materials in Teaching Social Studies, during consecutive semesters. The students enrolled in Education 431 during the first semester served as the experimental group and those enrolled in the same course during the next semester served as the control group. Prior to initiating the instructional procedures with each group, control variable data was gathered on each subject in the study. The control variables were age, sex, overall grade point average, marital status, and results on the Teaching Situation Reaction Test, The Minnesota Teacher Attitude Inventory, and Form E of the Dogmatism Scale.

The experimental group received four periods of instruction regarding a modified Gallagher and Aschner questioning category System presented via video tape, prepared handouts, and discussion. The control group received four periods of instruction through the use of prepared handouts, discussion, and other verbal means only, concerning the modified Gallagher and Aschner questioning category system.

During the student teaching experience each student teacher's questioning behavior was audio taped for twenty minutes on five different occasions. Students in two classes taught by subjects of this study, on three different occasions, wrote questions based on controlled information. Each question transcribed from the audio tapes and written on the student response sheets was categorized according to the modified Gallagher and Aschner categories. The data collected was statistically analyzed by use of chi square ($X^2$) to determine the rejection or acceptance of the null hypotheses.

## Importance of the Problem

The major contribution of this research study will be to supply

data to teacher educators concerning the effects of the video tape modeling concept on: (1) the cognitive level of oral classroom questions asked by student teachers in the area of social studies; and (2) the cognitive level of questions written by students taught by subjects of this study. Development of this vital skill by both teachers and students is necessary for sustaining the on-going revision of the social studies curriculum. This revision has at its core the inquiry and problem solving approach via active student participation. Raising and sustaining the cognitive level of classroom interaction through which social studies students gain initial skill in probing techniques becomes a basic responsibility of the teacher.

## Research Questions and Hypotheses

This study was conducted to determine if student teachers in the experimental group function at significantly higher levels of questioning behavior than student teachers in the control group and if students taught by experimental group student teachers write questions at a higher level as a result of modeling. Specifically the research hypotheses are:

1. Student teachers in the experimental group will use a significantly higher proportion of high level oral classroom questions than student teachers in the control group.
2. Student teachers who ask a larger number of questions will use a significantly higher proportion of low level oral classroom questions than student teachers who ask fewer questions.
3. Student teachers in the experimental group will ask a significantly higher proportion of high level questions at the end of the student teaching experience than at the beginning.
4. Students taught by experimental group student teachers will use a significantly higher proportion of high level written questions than students taught by the control group student teachers.
5. Students taught by the experimental group student teachers will write a significantly higher proportion of high level questions at the end of the student teaching experience than at the beginning.

Although this study does not lend itself to formally hypothesizing about the control group and students in their classes, questions relative to them appear to warrant investigation. Specifically the questions are:

1. Do student teachers in the control group ask a higher proportion of high level questions at the end of the student teaching experience than at the beginning?
2. Do students taught by control group student teachers write a higher proportion of high level questions at the end of the student teaching experience than at the beginning?

## Limitations of the Study

The term limitation in this research will be defined as those

variables which were not adequately controlled within the study design. These variables are enumerated as follows:

1. This study was limited to those students who enrolled in Education 431, Methods and Materials in Teaching Social Studies at Fairmont State College.
2. The treatment/no treatment was limited to four 50-minute class periods.
3. Only the cognitive level of classroom questions asked by subjects of this study and written by their students were investigated.
4. Data gathering relative to the student teachers was limited to five 20-minute audio tape recordings made during the early, middle, and later portions of the student teaching experience; thus not all classes were observed.
5. Data gathering relative to the students taught by subjects of this study was limited to three written exercises completed during the early, middle, and later portions of the student teaching experience by the same two classes of students; thus, not all students responded.
6. The control variables for this study were limited to age, sex, marital status, overall grade point average, and results on the Teaching Situation Reaction Test (TSRT), the Minnesota Teacher Attitude Inventory (MTAI), and Form E of the Dogmatism Scale (D-Scale).
7. The classroom students ability to imitate or model the student teachers questioning behavior was not adequately controlled due to such individual characteristics of the students as age, grade placement, attitude toward the school, subject and teacher, and intellectual potential.
8. The investigator was not able to control the environment of the student teachers, their activities, or the activities of their students during observation for data gathering.

## Definition of Terms

Categories - Categories refer to the cognitive levels of thinking constructed by Gallagher and Aschner primarily on the operations of intellect as Guilford described them. The categories are hierarchical and consist of, from lowest to highest cognitive level of thinking, cognitive memory, convergent, divergent, and evaluative. An additional category was added for this study. This additional category was called "Others" to accommodate non-cognitive questions.

Cognitive level - That level of intellectual complexity involved in any thinking act with each level including all levels below it. In this study it specifically refers to that questioning category level at which the student teacher or their students are operating in the classroom.

Cognitive memory - Questions in this category are designed to call forth specific facts, formulae, or other items of remembered content through the use of such processes as recognition, rote memory,

and selective recall. The teacher expects answers drawn directly from the students memory bank.

Convergent - Questions in this category are designed to call forth responses that require analysis or integration of given or remembered data. The answer will be tightly structured and given within a specific framework. There is usually a right answer which the teacher expects the student to have reasoned out by having used a previously learned idea such as a skill, definition, principle, or generalization.

Divergent - Divergent questions are designed to cause students to generate new data, formulate hypotheses, or develop a novel solution to a given problem. The results will not be one correct response but many good answers which students may work out in a creative and imaginative way.

Evaluative - Evaluative questions are designed to cause students to make judgements, express their values or opinions of some product, communication, event, or situation. The student must construct his own standards of evaluation and evaluate accordingly.

High level questions - Those questions asked or written that are categorized as convergent, divergent, or evaluative.

High proportion - That level of question use into which individuals or groups were placed when the proportion of such use was above the median.

Imitation - That behavior resulting from observational learning.

Low level questions - Those questions asked or written that are categorized as cognitive memory.

Low proportion - That level of question use into which individuals or groups were placed when the proportion of such use was below the median.

Modeling - An actual performance, live or filmed, which provides specific cues for shaping the behavior of others.

Others - That category added to the Gallagher and Aschner system for use in this study. Included in this category were any questions that were administrative or procedural in nature.

Over time - That period of time between designated audio tapes and student responses. The length of time is specified for each hypotheses in Chapter III.

Perceptual model - A video taped model of the specific teaching skill of question asking at the different cognitive levels of the Gallagher and Aschner system.

Proportion - That part of the total number of cognitive questions asked or written at each of the levels of the modified Gallagher and Aschner category system.

Question - Refers to any intellectual exercise that requires a response; this would include both problems and projects.

Social sciences - Those disciplines that are concerned with human relations and which support that phase of the educational curriculum termed the social studies.

Social studies - That phase of the instructional program which draws content from the social science.

Symbolic - That information presented or received in written or printed form.

Symbolic model - That written or printed information relative to the specific teaching behavior of questioning that was used with both the experimental and control groups of this study.

## Summary

This chapter has provided a general background to the problem statement and importance of the study. Included were descriptions of the research sample, the control variables, treatment, and data gathering and analysis procedures. Also provided was information regarding the importance of the questioning skill to effective social studies instruction. The general research hypotheses and related questions were stated, the limitations of the study were enumerated, and specific terms were identified.

## Organization of the Remainder of the Study

Chapter II consists of a review of representative literature. It includes literature applicable to oral question phrasing practices of teachers; programs to effect change in questioning behavior; modeling as a behavior modification technique; and the impact potential a teacher model has on the imitative behavior of students.

Chapter III presents the methods and procedures followed in the study. The population and sample are described, the experimental procedures are outlined, the instrumentation and statistical procedures are explained, and the hypotheses stated in the null form are presented.

Chapter IV consists of the presentation and analysis of the data relative to the control variables and the null hypotheses.

Chapter V presents the summary, conclusions, and recommendations of the study.

## CHAPTER II

## REVIEW OF RELATED LITERATURE

The purpose of this chapter is to present a review of representative literature concerning: (1) the verbal question phrasing practices of teachers in general and social studies student teachers in particular; (2) efforts in preservice and inservice teacher education programs to alter teacher questioning behavior; (3) the modeling concept as a technique for modifying student teacher verbal behavior; (4) the impact of the teacher model on the imitative behavior of students.

The last decade was one in which there was a noticeable increase in research relative to both teacher verbal behavior and the use of the modeling concept to improve teacher skills. Only a brief summary of the work done on problems closely related to the one identified for this study will be presented in this review.

### Questions in Teaching

Research relative to teacher question asking practices remained quite sparse until the last decade. From the early work of Stevens (Farley, 1968) to such recent studies as Blosser (1970), Ebert (1970), Gall (1970), and Jacobsen (1971), concern was evidenced regarding both the quantity and quality of the many questions asked by teachers during an average school day and in those subjects under investigation.

Stevens, in her early work, found that social studies and English teachers asked a mean average of 395 questions each day with dominant emphasis being on the cognitive memory level. This early research provided evidence that pupils, in being required to recall textbook information 67 percent of the time, were not being prepared to think on higher cognitive levels. (Gall, 1970; Hunkins, 1967)

Gatto's work in 1921, while designed to investigate pupil's questions, revealed that there was an overwhelming emphasis on memory questions and activities, a reflection of the types used by their teachers. (Tinsley and Davis, 1971; Hunkins, 1967)

In 1935 Haynes examined the questions asked by teachers in sixth-grade history classes and found that 77 percent of the questions called for cognitive memory answers while only 17 percent were on a higher cognitive level. (reported in Gall, 1970) Haynes also noted a significant correlation between the intelligence of teachers and the

quantity of higher cognitive level questions asked - teachers with high intelligence asked more higher order questions.

A study by Floyd (1960) examined the oral questioning practices of selected primary teachers. Results of this study indicated that teacher talk made up about 70 percent of all class talk; that 93 percent of all questions asked were asked by the teachers, and, that teachers asked on an average of 348 questions during a school day. Forty-two percent of the teacher questions were on the cognitive memory level. A comparison of earlier studies with those of more recent research on teachers' oral questioning practices reveals a consistent use of cognitive memory type questions. (Hunkins, 1967)

Adams (1964) in an investigation of questions asked by secondary social studies and English teachers, discovered a dominating, though to a significantly lesser degree that Steven's 1912 study, use of cognitive memory questions.

The studies by Davis and Tinsley (1967) and Rogers and Davis (1970) both revealed continuing employment of mainly cognitive memory questions in classroom verbal interaction. The Davis and Tinsley study utilized a rating scale they had developed to measure the range of cognitive objectives. Cognitive memory was the dominant question emphasis.

Schreiber (1967) investigated social studies teachers' question asking practices. Conclusions of this study revealed that the prevalent type used was the cognitive memory and that higher order questions were used very little.

Crump (1969) conducted a study to determine whether or not programmed materials designed for independent study would be successful in changing the questioning techniques of teachers. Questions asked by her subjects during pre-instruction were categorized as 89.1 percent reproduction and translation while post-instruction use of questions by the same subjects revealed that use of such lower order questions dropped to 73.4 percent.

In an effort to describe and compare questioning practices, Godbold (1970) investigated the length of professional experience in an elementary contrasted with a secondary setting to determine the effects each had on oral questioning behavior. The conclusion was that recall was the most common questioning practice.

It is apparent from the research stated that teachers talk during instruction and that much of the talk is of the questioning nature. It is also evident that when questioning, teachers use a high percentage of cognitive memory type questions. Such questions are not conducive to increasing the level of thinking required in classrooms where the new social studies is under implementation. Gall (1970:713) concluded "that in a half-century there has been no

essential change in the types of questions which teachers emphasize in the classroom. About 60 percent of teachers' questions require students to recall facts; about 20 percent require students to think; and the remaining 20 percent are procedural."

## Research on Modifying Questioning Behavior

While many early and current research studies have been concerned with the quality and quantity of questions asked by classroom teachers, more recent studies have been concerned with conducting research relative to improving teachers' question framing skills.

Gall (1970) credits the 1938 inservice educations program of Houston as being one of the earliest effective programs devised to change teachers' questioning practices. As a result of using such techniques as group conferences, stenographic reports, self-analysis, and supervisory evaluations, Houston's program enabled the teachers', as a group, to ask more relevant questions regarding the information being studied; to raise student participation; and to ask more questions requiring manipulation of facts.

Elementary science students trained in the use of inquiry skills (Suchman, 1960) altered their questioning practices and thus improved their inquiry skills over a 15-week period. The students viewed short, silent films of physics demonstrations in which problems were posed. The students attacked the problems using probing questions as a means of gathering data on which to perform imaginary experiments. The questions posed by the students could only be answered yes or no by their teachers. This required the students to provide all the data and the teachers to accept or reject the questions as stated or to redirect the questions or episode under consideration.

Claus (1968), in her study of the effects of modeling and feedback variables in training student teachers to use higher order questions, concluded that treatments involving modeling with cues were clearly more effective in training student teachers to use higher order questions than modeling without cues.

Student teachers instructed in a symbolic manner only regarding Sander's levels of questioning and their use in instruction (Farley, 1968), significantly increased their use of above memory or higher order questions. Students in the control group asked 31.5 percent memory and 68.5 percent above memory questions whereas students in the experimental group asked 16.7 percent memory and 83.3 percent above memory questions.

The effect self-instruction via programmed materials designed for independent study could have on raising the level of teachers' questions in intermediate grade social studies was investigated by Crump (1969). She concluded that self-instruction can increase both oral and written use of above cognitive memory level questions.

A program to enable teachers to learn essential questioning skills has been developed by the Far West Laboratory for Educational Research and Development. The treatment consists basically of the use of instructional and model color film and a refined and improved microteaching process. In a field test with 48 elementary teachers, such significant changes as the frequency of redirection questions from 26.7 percent to 40.9 percent and an increase in thought questions from 8.3 percent to 13.9 percent were experienced (Gall, 1970).

Griffin (1970) developed a sequence of 13 probe questions aimed at lifting questions off the usual who, what, and when levels. The probing sequence was aimed at causing students to manipulate facts and substantiate positions.

In an investigation of the cognitive level of teacher oral questions by users and non-users of curriculum guides, Huenecke (1970) concluded that users tended to ask more questions at the four higher levels of Bloom's Taxonomy - Cognitive Domain.

## The Modeling Concept

Perceptual modeling is an ancient concept that has gained increased research attention with assistance from modern technology. As defined for this study, perceptual modeling is viewed as an actual performance, live or filmed, which provides specific cues for shaping the behavior of others. If the viewer of the performance accepts the behavior modeled, he becomes an imitator of the model, and when his behavior is imitated by others, a model himself.

The use of perceptual models in all cultures as means of shaping the behavior of the cultural participants evidences the strength of the concept. Paulsen (1968), in his discussion of the comparability of all human cultures, indicates that anthropologists have concluded that human behavior can be modified or shaped in almost any direction.

Linton (1968), when viewing the extent to which men have knowledge of and participate in their respective cultures, states that no individual is ever familiar with, in control of, or in need of, the total content of the culture of the societies in which they participate. That which man is in control of is in part indicative of his perceptual model availability and his model choice.

Specific research applying the modeling concept to controlled experimentation with human behavior modification was conducted during the 1930's (Fitzgerald, 1970). Much of the early experimentation was done with children in such areas as play, facial expressions, therapy, social expressions, etc., and resulted in evidence supporting imitative learning and modeling.

Fitzgerald (1970), in his review of modeling and imitation, cites the works of Bandura (1961, 1963, 1967), Krumboltz (1967), and Walters (1962) as evidence of the research done to ascertain the effect modeling and imitation have on various age and situational groupings. Bandura's experimentation in 1967 with filmed and real life models in the area of aggression indicated that not only agression per se, but specific types of aggression are imitated as a result of the real and filmed models. The works cited support the application of modeling and imitative procedures in all age groups and in those situations for which a model can be adequately presented.

Specifically applicable to this study was the work done during the 1960's in the area of video taped modeling and the effect such a procedure has on the behavior modification of student teachers. Television techniques and modeling have received increasing use in teacher education programs. In a study conducted by Orme (1966) it was found that the viewing of one's own performance and a modeled performance with supervisory reinforcement was the most effective of six modes of instruction for training in the use of probing questions. A 1967 study by Young (1968), in which a symbolic model presented via printed material on rationale and control methods, and two different perceptual models, one a 16 millimeter film model and the other a video tape model, were used to train preservice teachers in control techniques, produced evidence that the video tape perceptual model effected more consistent behavior changes.

Lange (1968), in an investigation of behavior modification, utilized prestige and no prestige video tape models while controlling with neutral films, and concluded that viewing a specifically modeled set of behaviors produced a significant amount of the same behavior in the student teachers who observed it.

A study of the effect modeling and feedback have on the learning of questioning behavior was conducted by Ebert (1970). She concluded that a Minicourse Condition was more effective, though not significantly so, than the Regular Nursing Condition. The Minicourse Condition was presented via a combination of perceptual and symbolic modeling with cueing and the feedback consisted of self-viewing of the video taped performance with written cues whereas the Regular Nursing Condition was presented via symbolic modeling with feedback being via joint viewing of video taped performance with discrimination prompts and reinforcement being provided by the supervisor.

A study by Fitzgerald (1970) in which a modified Flanders Interaction Analysis System was presented perceptually via video tape to an experimental group of student teachers and symbolically via discussion and other verbal means only to a control group of student teachers, indicated significant differences in favor of the perceptual modeling approach in the majority of the modeled behaviors. Of specific interest to this study was that the two groups of student teachers did not differ significantly in asking questions in their classrooms.

## Impact of Modeling on the Imitative Behavior of Students

The impact that perceptual modeling of a particular teaching technique by student teachers has on students, appears to be only sparsely defined by research. Research attempts to define this impact have been basically concerned with the inservice teacher and the effect his arrangement of materials, attitudes, and method of presentation has on the achievement and attitude of students. It has been assumed that if an increase in achievement or the desired change in attitude by the student has occurred, such occurrence can be attributed to the model having been sufficient to cause the imitative behavior.

Several research studies that are available lend support to the importance of the teacher model in the use of questions in the social studies classroom and the impact the cognitive level of questions have on students. Gallagher and Aschner (1963) support the position that a teacher's cognitive behavior level affects the student's thinking level. Taba (1964) found an almost perfect correlation between the cognitive level of student responses and the cognitive level of questions asked by the teachers.

In an investigation of the relationship between text-type questions and student achievement, Hunkins (1969) concluded that employment of higher cognitive level questions significantly affected the achievement scores of the subjects involved. The conclusion reached by Wood, Brown, Ober, and Soar (1969) regarding the importance of teacher questions in stimulating student thinking was that as the cognitive level of student teachers increases, a reciprocal increase occurs in the level of cognitive behavior of their students with the reverse also being true. Godbold (1970:61-67) states that "there is a growing body of evidence that teacher-questioning has an influence on pupil thinking, social-emotional climate of the classroom, and pupil mastery of subject matter."

As one would expect, not all research readily supports the positive impact teacher modeled questions have on the imitative behavior of students. Rodgers (1969:39) in an investigation of the use of higher level oral questions by teachers concluded that "the influence of higher level questions on pupil achievement is, as yet, not well defined."

Inasmuch as this growing body of research evidences conflicting views, there appears to be a need for additional information regarding whether or not the student teacher model can have a significant impact on the imitative behavior of students and how such teacher models can be trained to assure such an impact taking place.

## Summary

The literature reviewed in this chapter supports the problem

identified in this study. The review consisted of a survey of pertinent literature relative to: (1) the quantity and quality of social studies classroom questions; (2) selective attempts to modify the questioning behavior; (3) the use of the modeling concept in preservice teacher education programs; and (4) the impact modeling by the student teacher has on the imitative behavior of students.

The review further indicated that research in preservice teacher education programs was employing, with positive results, recent innovations in educational technology such as video tape ensembles. This suggested support for the use of video taping procedures and the perceptual modeling concept to modify the questioning behavior of student teachers.

# CHAPTER III

# METHODS AND PROCEDURES

## Introduction

The purpose of this chapter is to present the methods and procedures followed in this research. The population and sample are described, the experimental procedures and instructional materials are outlined, and the instrumentation and statistical procedures are explained.

## Population and Sample

The subjects of this study were those students enrolled in Education 431, Methods and Materials in Teaching Social Studies, Fairmont State College, Fairmont, West Virginia. Education 431 is a professional education course designed to provide instruction in special methods relative to a student's specific area of concentrated study.

Projected enrollment figures indicated there would be 26 students enrolled each semester in Education 431. The 26 students enrolled in Education 431 during the first semester served as the experimental group and the 26 students enrolled in the same course during the next semester served as the control group.

Although 52 students comprised the original population sample, several uncontrolled factors reduced the size of the experimental and control groups to 18 and 18 respectively. Of the 26 students in the experimental group on whom initial control variable data were gathered, two did not complete the experimental treatment; one did not complete the pre-student teaching block; one withdrew from the student teaching experience; and four, due to factors of their student teaching assignments, were unable to collect data. This reduced to 18 the number of student teachers in the experimental group from whom audio tape and student response data was gathered.

The control group was reduced in size when four students were absent during part of the symbolic treatment; one withdrew from the pre-student teaching block; one student was not scheduled for student teaching; and two, due to factors of their student teaching assignments, were unable to collect data. This reduced to 18 the number of student teachers in the control group from whom audio tape and student response data were gathered.

Prior to initiating the instructional procedures with each group, data relative to the control variables of age, sex, overall grade point average, and marital status along with results on the Teaching Situation Reaction Test (TSRT), the Minnesota Teacher Attitude Inventory (MTAI), and Form E of the Dogmatism Scale (D-Scale) were gathered from each subject in the study. Copies of the data gathering instruments, with the exception of the MTAI, are presented in the Appendices. (re: Appendix A, B, and C) The MTAI was not included in the Appendices because of its established reputation and copyright restrictions.

The subjects of this study were enrolled in additional professional education courses while enrolled in Education 431. The instructors of these courses were requested to delete from their course presentations and materials that which might have served to contaminate this study.

## Experimental Procedures

Education 431 met on Tuesday and Thursday from 1:30 to 3:30 each week during the pre-student teaching professional block. A Tuesday and Thursday of the same week were used during one semester to provide treatment to the experimental group and a Tuesday and Thursday of the same week during the next semester were used to provide treatment to the control group.

The instructional information and classification system developed for this study was a modification of the cognitive levels of thinking constructed by Gallagher and Aschner (1963) primarily on the operations of intellect as Guilford (1956) described them. The original Gallagher and Aschner categories of cognitive levels of thinking were cognitive memory, convergent, divergent, and evaluative. An additional category called "Others" was added to accommodate those questions that could not be classified in one of the four major categories. Examples of "Others" would be those questions that were administrative or procedural in nature. Classification into this additional category eliminated those questions from consideration in the statistical analysis relative to the hypotheses of this study. The original definitions and examples presented by Gallagher and Aschner were expanded to include ideas from outlines presented by Crump (1970: 658-659) relative to the levels of questions and cognition and categories of questions. The use of such internal modifications establishes a closer relationship between the Gallagher and Aschner categories and the other classification systems outlined by Crump.

The modified Gallagher and Aschner system used in this study was both practical and useful (Adams, 1964:51-52) in that: (1) it could be translated into an instructional program regarding the questioning skill; and (2) it offered a sufficient number of categories whereby discrimination among questions could be done in a meaningful

way. This meets the needs of having categories that are totally inclusive but with each category being mutually exclusive.

All instructional information used was the same for both the experimental and control groups. Questions used in both the symbolic and perceptual phrases of the treatments were judged for proper category placement by three teacher educators prior to use with subjects of this study.

The instructional procedures and information used during the Tuesday treatment sessions were identical for both the experimental and control groups. Following an oral overview of the effect a teacher's level of questioning could have on the cognitive level of thinking practiced by their students, each subject received a handout entitled "The Use of Questions as a Teaching Technique." (Appendix D) This first handout introduced both groups to controlled information relative to general terminology, definitions, and examples of the modified Gallagher and Aschner categories. The second half of each Tuesday session was used for individual and group practice in classifying questions via use of the "Practice in Classifying Questions" handout (Appendix E) and practice in writing questions based on the "Practice in Writing Questions - American History" handout (Appendix F).

During the first half of the Thursday session the Experimental group was introduced to the independent variable of this study, the perceptual or video tape model. The video tape model was the author of this study asking sample questions in each of the Gallagher and Aschner categories. Discussion of each category, situation, and example was held as needed. The script used by the perceptual model was used as controlled symbolic information with the control group during the first half of their Thursday session. (re: Appendix G) The second portion of each Thursday session was devoted to individual practice in writing and asking questions based on information found in the "Practice in Writing Questions - Sociology" handout (Appendix H).

The treatment schedule, in outline form, was as follows:

| Experimental Group | Control Group |
|---|---|
| Tuesday | Tuesday |
| 1. Symbolic treatment and related discussion | 1. Symbolic treatment and related discussion |
| 2. Individual and group classifying and writing practice | 2. Individual and group classifying and writing practice |
| Thursday | Thursday |
| 1. Perceptual treatment in the form of a video tape model | 1. Symbolic use of script developed for video tape model |

| | |
|---|---|
| 2. Individual and group practice in writing and asking questions | 2. Individual and group practice in writing and asking questions |

Upon completion of the professional block courses the students reported to their student teaching assignments. The student teaching assignments were made by the Coordinator of Laboratory Experiences according to the needs of the total student teaching program. A list of the specific school, some basic characteristics of each school, and the county in which each is located is presented in the Appendices. (re: Appendix I)

## Instrumentation

Arrangements were made to record on audio tape five different 20-minute segments of classes taught by each subject in the study. These recordings were made during the early, middle, and later portions of the eight week student teaching experience.

Students in two classes taught by subjects of the study were presented with controlled written stimulus materials. (re: Appendix J) They were asked to read the information and write two or more questions they would ask or want answers to. This process was followed in the same two classes on three different occasions during the early, middle, and later portions of the eight week student teaching experience.

Inter-reader agreement regarding the classification of questions was established by use of randomly selected audio tape transcripts and student response sheets. On three different occasions, the director of this study and two social studies educators read and categorized a randomly chosen student teacher transcript and a set of student response sheets. Reliability (Jersild, 1939; Huenecke, 1970) was determined by use of the formula $r=\frac{x}{y}$ where x equals the number of agreements and y equals the total number of observations.

The percentage of agreement reached on each of the three occasions was 85 percent, 91 percent and 90 percent. (re: Appendix K) These percentages of agreement established inter-reader agreement at an overall acceptable level (Jersild, 1939:177) of 88 percent. The author of this study completed the categorizing phase of the research under the assumption that only minor discrepancies would result when he was the sole categorizer.

## Statistical Procedures and Null Hypotheses

Initially a statistical comparison of the experimental and control groups on seven control variables was made by using a combination of the *t* and chi square tests. The *t* test was used to compare

the experimental and control groups on the variables of age, grade point average, and results of the Minnesota Teacher Attitude Inventory, the Teaching Situation Reaction Test, and the Dogmatism Scale. Chi square was used to compare the groups on the variables of sex and marital status.

All questions transcribed from the audio tape recordings and written on the student response sheets were categorized into the categories of the modified Gallagher and Aschner category system. Questions categorized as cognitive memory were considered as low level questions and those classified as convergent, divergent, and evaluative, were considered as high level questions. The categorized data were used to compute proportions of questions asked in each category for each individual student teacher and for each group of student responses. These proportions rather than raw scores are the basis for all subsequent analysis.

The proportion of questions asked or written in each category were ranked "high" or "low" for each individual by assigning to the "high" rank those proportions above the median and to the "low" rank those below the median.

Statistical analysis of the proportional data was made by using a combination of the chi square and the Fisher exact probability test. Use of these nonparametric statistics enabled the researcher to retain the individual identities of the research subjects. The low expected frequencies in hypotheses one, two, and four, required the use of Yate's correction for continuity with the chi square test. The even smaller expected frequencies in hypotheses three and five required the use of Fisher's exact probability test. The .05 level of significance was used throughout the statistical analysis to determine whether or not to reject the null hypotheses. All hypotheses are directional and use a one-tailed test of significance.

Hypotheses one, two, and three are concerned with student teachers and hypotheses four and five with two classes of students taught by student teachers. Specific procedures are discussed with each hypothesis below stated in the null form.

Hypothesis one. There will be the same or significantly fewer high level oral classroom questions asked by student teachers in the experimental group as compared to student teachers in the control group.

The proportions of all questions asked in each category by student teachers in both groups were used to rank students in their frequency of use of questions. Those above the median were called "high" users and below the median "low" users.

Hypothesis two. There will be the same or significantly fewer low level oral classroom questions asked by student teachers who ask a

larger number of questions compared to student teachers who ask fewer questions.

The proportion of the total number of questions asked and the proportions asked in each category by student teachers in both groups and each group separately were used to prepare a ranking of "high" and "low" question users. The hypothesis should hold for both experimental and control groups.

In addition to the formal hypothesis, a check will be made for significant differences in the total number of questions asked by the experimental compared to the control group using the t test.

Hypothesis three. There will be the same or significantly fewer high level oral classroom questions asked by student teachers in the experimental group at the end of the student teaching experience than at the beginning.

The "high" and "low" proportional use data for audio tapes one and five were used to make the over time comparison within the experimental group. Though not formally hypothesized, a parallel analysis was made on the control group. There were three intervening audio tapes compared to the over time student response analysis in hypothesis five where there was one intervening group of student responses.

Hypothesis four. There will be the same or significantly fewer high level written questions used by students taught by the experimental group student teachers as compared to students taught by the control group student teachers.

The proportions of all questions written in each category by students taught by both groups were used to rank students in their frequency of use of questions. This is analogous to the procedure used in hypothesis one.

Hypothesis five. There will be the same or significantly fewer high level written questions used by students taught by experimental group student teachers at the end of the student teaching experience than at the beginning.

The "high" and "low" proportional data from student responses one and three were used to make the over time comparison. There was one intervening group of student responses compared to three intervening student teacher audio tapes in hypothesis three. Though not formally hypothesized, a parallel analysis was made on the control group student responses.

## Summary

Two groups of secondary social studies student teachers at

Fairmont State College served as subjects of this study. The experimental group consisted of those students enrolled during the first semester and the control group consisted of those enrolled during the second semester. Data relative to selected control variables were collected on the subjects in each group.

The experimental group was instructed by both perceptual and symbolic procedures. The control group was instructed by symbolic means only.

Data on the two groups and students in their classes were gathered by means of audio tape recordings and written responses to controlled written information. The data collected were used to establish proportional values in each questioning category and the proportional values were the basis of all subsequent analysis. The null hypotheses were stated with specific procedures relative to each.

# CHAPTER IV

## RESULTS AND DISCUSSION

### Introduction

The purpose of this chapter is to present the findings of this study. The data concerning the pre-treatment control variables are analyzed and interpreted to determine if there were any significant differences between the experimental and control groups on each of the control variables. The data concerning the questioning behavior of the experimental and control groups and students taught by each group are analyzed and interpreted to determine if the null hypotheses stated in Chapter III can be accepted or rejected. A discussion is presented regarding possible reasons for the results of the study.

### Control Variables

The control variables used in this study were those of age, overall grade point average, sex, marital status, and results on the Teaching Situation Reaction Test (TSRT), the Minnesota Teacher Attitude Inventory (MTAI), and the Dogmatism Scale (D-Scale).

Data presented in Tables I, II, and III, show the results of the statistical treatment comparing the experimental and control groups on each of the control variables. These tables show that the two groups of student teachers did not differ significantly on any of the control variables. Complete control variable data on each group are found in the Appendices. (re: Appendix L)

### The Hypotheses

The null hypotheses of this study are restated and the data concerning each are analyzed and interpreted to determine if a particular hypothesis can or can not be rejected. The data for each analysis and interpretation are compared by use of either the chi square test or Fisher's exact probability test. Results of each chi square and direct probability test and related proportional values are arranged in tables and figures. A brief discussion of each hypothesis is presented.

To obtain more accurate proportions of questions asked or written in each category, it was arbitrarily decided to combine the relatively small number of observed frequencies in the evaluative categories with the observed frequencies in the divergent categories.

TABLE I

t TEST COMPARISON OF THE EXPERIMENTAL GROUP WITH THE CONTROL GROUP ON SEVERAL CONTROL VARIABLES

| Control Variables | Experimental Group (N=18) | | Control Group (N=18) | | | |
|---|---|---|---|---|---|---|
| | $\bar{X}$ | S.D. | $\bar{X}$ | S.D. | t | p |
| Age | 22.33 | 3.61 | 22.16 | 1.83 | .17 | n.s. |
| GPA | 2.75 | .50 | 2.65 | .40 | .65 | n.s. |
| MTAI | 56.38 | 7.28 | 53.72 | 25.45 | .41 | n.s. |
| TSRT | 197.88 | 16.58 | 205.88 | 17.17 | 1.38 | n.s. |
| D-Scale | 134.00 | 30.61 | 131.11 | 19.67 | .38 | n.s. |

TABLE II

CHI-SQUARE TEST OF COMPATIBILITY BETWEEN MALES AND FEMALES OF 18 EXPERIMENTAL SUBJECTS AND 18 CONTROL SUBJECTS

| Sex | Experimental Group | | Control Group | | Totals | p |
|---|---|---|---|---|---|---|
| Male | 9 | (10.00) | 11 | (10.00) | 20 | |
| Female | 9 | ( 8.00) | 7 | ( 8.00) | 16 | |
| Totals | 18 | | 18 | | 36 | n.s. |

Chi-Square = .45 (Expected frequencies in parentheses)
.05 level = 3.841 for 1 df

TABLE III

CHI-SQUARE TEST OF COMPATIBILITY BETWEEN 18 EXPERIMENTAL SUBJECTS AND 18 CONTROL SUBJECTS WITH REGARD TO MARITAL STATUS

| Marital | Experimental Group | | Control Group | | Totals | p |
|---|---|---|---|---|---|---|
| Single | 13 | (13.00) | 13 | (13.00) | 26 | |
| Married | 5 | ( 5.00) | 5 | ( 5.00) | 10 | |
| Totals | 18 | | 18 | | 36 | n.s. |

Chi-Square = .00 (Expected frequencies in parentheses)
.05 level = 3.841 for 1 df

This decision was made for both the student teacher groups and the student groups. Data presented in the tables and figures of this chapter are in a three-category cognitive system, whereas data in the Appendices are in the four-category cognitive system. (re: Appendix M through P)

Hypothesis one. There will be the same or significantly fewer high level oral classroom questions asked by student teachers in the experimental group as compared to student teachers in the control group.

Data presented in Table IV show the results of the statistical treatment comparing the experimental and control groups on hypothesis one.

The chi square values for hypothesis one resulted in the null hypothesis being accepted. Though not significant in the direction predicted, the differences found would have been significant had the hypothesis predicted the control group would be better than the experimental group. The control group student teachers asked a higher proportion of high level questions and a lower proportion of low level questions than the experimental group. An additional analysis was made of the data used for hypothesis one. A comparison was made of the proportions of questions asked in each cognitive questioning level by the top and bottom 25 percent of the combined experimental and control group student teachers. The results of Fisher's exact probability test showed no significant differences between these extreme groups in the proportions of questions asked in the three cognitive categories.

Hypothesis two. There will be the same or significantly fewer low level oral classroom questions asked by student teachers who ask a larger number of questions compared to student teachers who ask fewer questions. (By implication there will be the same or significantly more high level questions asked by student teachers who ask fewer questions compared to student teachers who ask a larger number of questions.)

Data presented in Table V show the results of the statistical treatment comparing the student teachers on hypothesis two. The chi square test for hypothesis two resulted in a significant difference at the .05 level for a one-tailed test for each of the three levels of questioning. The null hypothesis was rejected. Those student teachers who asked a larger number of questions asked a higher proportion of cognitive memory questions than expected and a lower proportion of convergent and divergent-evaluative than expected. On the other hand, those student teachers who asked fewer questions during the student teaching experience, asked a higher proportion of high level questions than the student teachers who asked a larger number of questions. The experimental group student teachers were compared to the control group student teachers by use of the t test regarding the total number of

TABLE IV

CHI-SQUARE TEST COMPARING THE PROPORTION OF QUESTIONS ASKED AT THE THREE LEVELS OF COGNITIVE QUESTIONING BY THE EXPERIMENTAL AND CONTROL GROUP STUDENT TEACHERS (N=36)

| Student Teacher Group | Proportion of Cognitive Memory Questions | | | | | |
|---|---|---|---|---|---|---|
| | High | | Low | | Totals | p |
| Experimental | 11 | (9) | 7 | (9) | 18 | |
| Control | 7 | (9) | 11 | (9) | 18 | |
| Totals | 18 | | 18 | | 36 | n.s. |

Chi-Square = 1.00 (Expected frequencies in parentheses)
.10 level = 2.706 for 1 df

| Group | Proportion of Convergent Questions | | | | | |
|---|---|---|---|---|---|---|
| | High | | Low | | Totals | p |
| Experimental | 9 | (9) | 9 | (9) | 18 | |
| Control | 9 | (9) | 9 | (9) | 18 | |
| Totals | 18 | | 18 | | 36 | n.s. |

Chi-Square = .00 (Expected frequencies in parentheses)
.10 level = 2.706 for 1 df

| Group | Proportion of Divergent-Evaluative Questions | | | | | |
|---|---|---|---|---|---|---|
| | High | | Low | | Totals | p |
| Experimental | 6 | (9) | 12 | (9) | 18 | |
| Control | 12 | (9) | 6 | (9) | 18 | |
| Totals | 18 | | 18 | | 36 | .05 |

Chi-Square = 2.76 (Expected frequencies in parentheses)
.10 level = 2.706 for 1 df

TABLE V

CHI-SQUARE TEST COMPARING THE PROPORTION OF QUESTIONS ASKED AT THE THREE COGNITIVE LEVELS OF QUESTIONING BY STUDENT TEACHERS (N=36) WHO ASK A HIGH NUMBER (ABOVE MEDIAN) OF QUESTIONS AND THOSE WHO ASKED A LOWER NUMBER (BELOW MEDIAN)

| Proportion of Total Questions | Proportion of Cognitive Memory Questions | | | | | |
|---|---|---|---|---|---|---|
| | High | | Low | | Totals | p |
| High | 13 | (9) | 5 | (9) | 18 | |
| Low | 5 | (9) | 13 | (9) | 18 | |
| Totals | 18 | | 18 | | 36 | .05 |

Chi-Square = 5.44 (Expected frequencies in parentheses)
.10 level = 2.706 for 1 df

| Proportion of Total Questions | Proportion of Convergent Questions | | | | | |
|---|---|---|---|---|---|---|
| | High | | Low | | Totals | p |
| High | 6 | (9) | 12 | (9) | 18 | |
| Low | 12 | (9) | 6 | (9) | 18 | |
| Totals | 18 | | 18 | | 36 | .05 |

Chi-Square = 2.76 (Expected frequencies in parentheses)
.10 level = 2.706 for 1 df

| Proportion of Total Questions | Proportion of Divergent-Evaluative Questions | | | | | |
|---|---|---|---|---|---|---|
| | High | | Low | | Totals | p |
| High | 6 | (9) | 12 | (9) | 18 | |
| Low | 12 | (9) | 6 | (9) | 18 | |
| Totals | 18 | | 18 | | 36 | .05 |

Chi-Square = 2.76 (Expected frequencies in parentheses)
.10 level = 2.706 for 1 df

questions asked. The results of the t test resulted in no significant difference between the two groups in the number of questions asked.

The data presented in Table VI show the results of the statistical treatment for the experimental group only regarding hypothesis two.

The Fisher exact probability test resulted in no significant difference at the .05 level for the experimental group in each of the three cognitive levels of questioning. Though not statistically significant, the experimental group student teachers who asked a higher number of questions did ask proportionally more cognitive memory questions than those who asked a lower number of questions. This result was in the direction predicted. There was a slight tendency for the experimental group to ask more high level questions if they asked fewer questions.

The data presented in Table VII show the results of the statistical treatment for the control group only regarding hypothesis two. Although the Fisher exact probability test resulted in significant difference at the .05 level for the control group in the cognitive memory level of questioning, the significance did not stand up for the convergent and the divergent-evaluative categories. The student teachers in the control group who asked a larger number of questions asked a significantly higher proportion of low level questions than those who asked fewer questions. This result is as predicted and is consistent with the results of testing hypothesis two and with the separate analysis made on the experimental group.

Hypothesis three. There will be the same or significantly fewer high level oral classroom questions asked by the student teachers in the experimental group at the end of the student teaching experience than at the beginning.

The data presented in Table VIII show the results of the statistical treatment for hypothesis three.

The Fisher exact probability test for Table VIII resulted in no significant difference at the .05 level for each of the three questioning levels in hypothesis three. The null hypothesis must be accepted. Given individual differences, the experimental group student teachers maintained a consistent questioning pattern over time. The same proportion of high level questions were asked at the end of student teaching as at the beginning.

Though not formally hypothesized, a parallel analysis was made on the control group student teachers regarding hypothesis three. The data presented in Table IX show the results of the statistical treatment for the control group.

The Fisher exact probability test for Table IX resulted in a significant difference at the .05 level only for the use of convergent

TABLE VI

THE FISHER EXACT PROBABILITY TEST COMPARING THE PROPORTIONS OF QUESTIONS ASKED AT THE THREE COGNITIVE LEVELS OF QUESTIONS BY THE EXPERIMENTAL (N=18) GROUP STUDENT TEACHERS WHO ASKED A HIGH NUMBER (ABOVE MEDIAN) OF QUESTIONS AND THOSE WHO ASKED A LOWER NUMBER (BELOW MEDIAN)*

| Proportion of Questions Asked | Proportion of Cognitive Memory Questions | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 6 | 3 | 9 | |
| Low | 3 | 6 | 9 | |
| Totals | 9 | 9 | 18 | n.s. |

| Proportion of Questions Asked | Proportion of Convergent Questions | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 4 | 5 | 9 | |
| Low | 5 | 4 | 9 | |
| Totals | 9 | 9 | 18 | n.s |

| Proportion of Questions Asked | Proportion of Divergent-Evaluative Questions | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 4 | 5 | 9 | |
| Low | 5 | 4 | 9 | |
| Totals | 9 | 9 | 18 | n.s. |

*A split of at least 7 and 2 with these marginals would be needed for significance at the .05 level for a one-tailed test.

TABLE VII

THE FISHER EXACT PROBABILITY TEST COMPARING THE PROPORTION OF QUESTIONS AT THE THREE COGNITIVE LEVELS BY THE CONTROL (N=18) GROUP STUDENT TEACHERS WHO ASKED A HIGH NUMBER (ABOVE MEDIAN) OF QUESTIONS AND THOSE WHO ASKED A LOWER NUMBER (BELOW MEDIAN)*

| Proportion of Questions Asked | Proportion of Cognitive Memory Questions | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 7 | 2 | 9 | |
| Low | 2 | 7 | 9 | |
| Totals | 9 | 9 | 18 | .05 |

| Proportion of Questions Asked | Proportion of Convergent Questions | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 3 | 6 | 9 | |
| Low | 6 | 3 | 9 | |
| Totals | 9 | 9 | 18 | n.s. |

| Proportion of Questions Asked | Proportion of Divergent-Evaluative Question | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 3 | 6 | 9 | |
| Low | 6 | 3 | 9 | |
| Totals | 9 | 9 | 18 | n.s. |

*A split of at least 7 and 2 with these marginals would be needed for significance at the .05 level for a one-tailed test.

TABLE VIII

THE FISHER EXACT PROBABILITY TEST COMPARING THE PROPORTIONS OF QUESTIONS ASKED AT THE THREE COGNITIVE LEVELS BY THE EXPERIMENTAL (N=18) GROUP STUDENT TEACHERS OVER TWO TIME PERIODS*

| Proportion of Questions Asked - Time 2 (Tape 5) | Cognitive Memory<br>Proportion of Questions Asked - Time 1 (Tape 1) | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 3 | 6 | 9 | |
| Low | 6 | 3 | 9 | |
| Totals | 9 | 9 | 18 | n.s. |

| Proportion of Questions Asked - Time 2 (Tape 5) | Convergent<br>Proportion of Questions Asked-Time 1 (Tape 1) | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 4 | 5 | 9 | |
| Low | 5 | 4 | 9 | |
| Totals | 9 | 9 | 18 | n.s. |

| Proportion of Questions Asked - Time 2 (Tape 5) | Divergent-Evaluative<br>Proportion of Questions Asked - Time 1 (Tape 1) | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 5 | 5 | 10 | |
| Low | 4 | 4 | 8 | |
| Totals | 9 | 9 | 18 | n.s. |

*A split of at least 7 and 2 with these marginals would be needed for significance at the .05 level for a one-tailed test.

TABLE IX

THE FISHER EXACT PROBABILITY TEST COMPARING THE PROPORTIONS OF QUESTIONS ASKED AT THE THREE COGNITIVE LEVELS BY CONTROL (N=18) GROUP STUDENT TEACHERS OVER TWO TIME PERIODS*

| Proportion of Questions Asked - Time 2 (Tape 5) | Cognitive Memory<br>Proportion of Questions Asked - Time 1 (Tape 1)<br>High | Low | Totals | p |
|---|---|---|---|---|
| High | 6 | 3 | 9 | |
| Low | 3 | 6 | 9 | |
| Totals | 9 | 9 | 18 | n.s. |

| Proportion of Questions Asked Time 2 (Tape 5) | Convergent<br>Proportion of Questions Asked - Time 1 (Tape 1)<br>High | Low | Totals | p |
|---|---|---|---|---|
| High | 8 | 1 | 9 | |
| Low | 1 | 8 | 9 | |
| Totals | 9 | 9 | 18 | .05 |

| Proportion of Questions Asked - Time 2 (Tape 5) | Divergent-Evaluative<br>Proportion of Questions Asked - Time 1 (Tape 1)<br>High | Low | Totals | p |
|---|---|---|---|---|
| High | 6 | 3 | 9 | |
| Low | 3 | 6 | 9 | |
| Totals | 9 | 9 | 18 | n.s. |

*A split of at least 7 and 2 with these marginals would be needed for significance at the .05 level for a one-tailed test.

questions. It would appear that individuals who used high level questions at the beginning continued to use them at the end.

In order to see the middle time periods for the experimental and control group student teachers, additional over time data is presented in Tables X and XI. The data from these tables are presented as line graphs in Figures 1 and 2. It was arbitrarily decided to combine the data for audio tapes two and three to represent the middle time period and tapes four and five to represent the final time period. This more closely relates this additional analysis with the additional analysis done over three time periods for hypothesis five.

Data presented in Figure 1 show the results of graphing the proportional values relative to the over-three-time-period analysis of the experimental group student teachers. The line representing tape one reflects the lowest proportion of Cognitive Memory questions asked and the highest proportion of Convergent and Divergent-Evaluative questions asked. Tapes two-three reflect the largest proportion of Cognitive Memory questions asked and the lowest proportion of Divergent-Evaluative questions asked. When the line representing tape one is compared to the lines representing the proportions of tapes two-three and four-five, the comparison does not favor an over time increase in the asking of higher cognitive level questions by student teachers in the experimental group. After experiencing an increase in the proportion of low level questions and a decrease in the proportion of high level questions during the middle time period (tapes two and three) the experimental group began to recover toward their initial proportions of questions at each level at the end of the student teaching experience. This may indicate that the student teachers began at their best level, slacked-off, and then surged again toward the end.

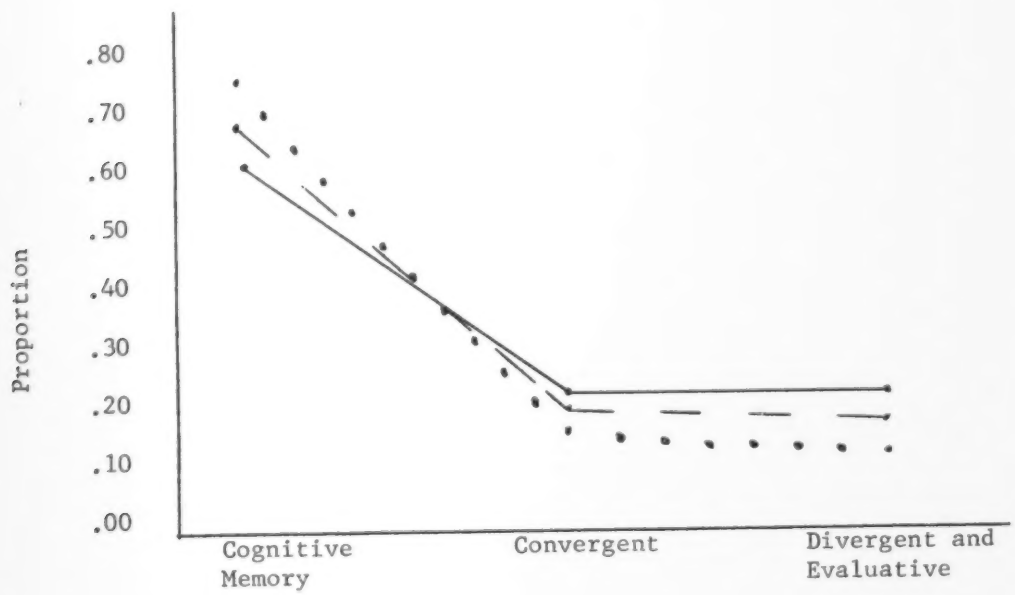
Data presented in Figure 2 show the results of graphing the proportional values relative to the over-three-time-period analysis of the control group. The graph line representing tapes four-five indicate that the control group student teachers asked a lower proportion of Cognitive Memory questions and a higher proportion of Divergent-Evaluative questions on tape four-five than they asked on tape one and tapes two-three. This would favor an increase over time in the asking of higher level cognitive questions by the control group student teachers. The line representing tapes two and three show that the highest proportion of low level questions and the lowest proportion of high level questions were asked during this middle period of time. This may indicate that the control group slacked-off during the middle period of time but recovered beyond their initial questioning level proportions.

Hypothesis four. There will be the same or significantly fewer high level written questions used by students taught by the experimental group student teachers as compared to students taught by the control group student teachers.

TABLE X

COMPARISON OF PROPORTIONS OF QUESTIONS ASKED BY EXPERIMENTAL (N=18) GROUP STUDENT TEACHERS BY LEVEL OF QUESTIONS OVER THREE TIME PERIODS

| Experimental Group - Audio Tape Numbers | Questioning Categories: Cognitive Memory | | Convergent | | Divergent and Evaluative | | Total Questions |
|---|---|---|---|---|---|---|---|
| | Number | p | Number | p | Number | p | |
| One | 313 | .60 | 105 | .20 | 103 | .20 | 521 |
| Two-Three | 853 | .74 | 169 | .15 | 130 | .11 | 1152 |
| Four-Five | 617 | .66 | 168 | .18 | 148 | .16 | 933 |
| Total Questions | 1783 | | 442 | | 381 | | 2606 |




Tape 1 ———
Tapes 2-3 . . .
Tapes 4-5 - - -

FIGURE 1

OVER TIME ORAL QUESTIONING BEHAVIOR OF EXPERIMENTAL GROUP STUDENT TEACHERS

TABLE XI

COMPARISON OF PROPORTION OF QUESTIONS ASKED BY CONTROL (N=18) GROUP STUDENT TEACHERS BY LEVEL OF QUESTIONS OVER THREE TIME PERIODS

| Control Group-Audio Tape Numbers | Questioning Categories: Cognitive Memory | | Convergent | | Divergent and Evaluative | | Total Questions |
|---|---|---|---|---|---|---|---|
| | Number | p | Number | p | Number | p | |
| One | 280 | .60 | 86 | .18 | 100 | .22 | 466 |
| Two-Three | 539 | .64 | 153 | .18 | 147 | .18 | 839 |
| Four-Five | 491 | .58 | 156 | .18 | 207 | .24 | 854 |
| Total Questions | 1310 | | 395 | | 454 | | 2159 |

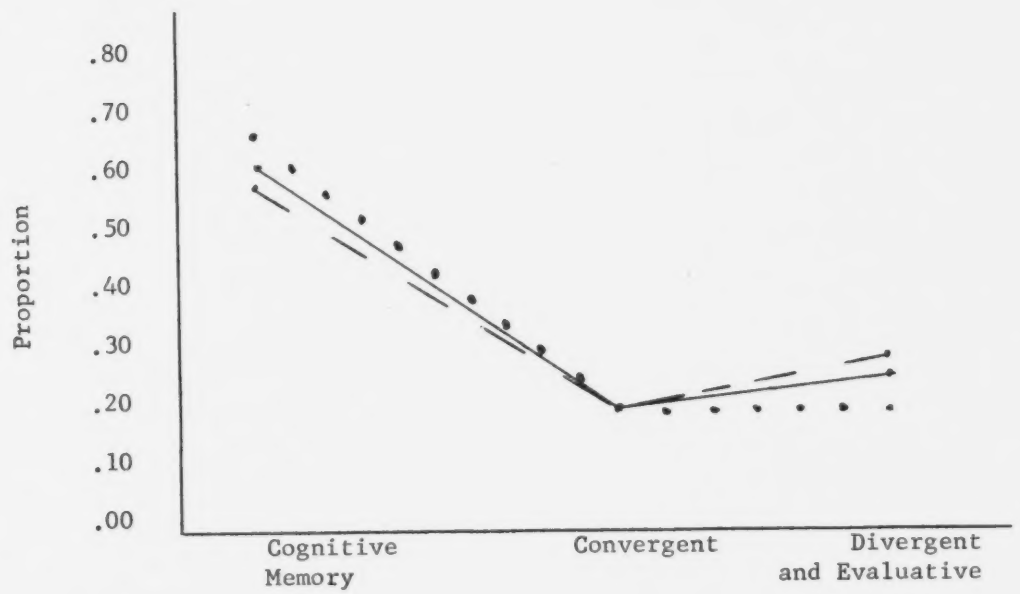



FIGURE 2

OVER TIME ORAL QUESTIONING BEHAVIOR OF CONTROL GROUP STUDENT TEACHERS

Data presented in Table XII, show the statistical treatment comparing the experimental and control group students on hypothesis four.

Although the Chi Square tests reported in Table XII resulted in significant differences at the .05 level for a one-tail test for two of the questioning levels, the null hypothesis must be accepted, as the results were opposite in direction to those predicted. The experimental group asked fewer convergent and divergent-evaluative questions rather than more high level questions as expected. Although not significant, the experimental group asked more cognitive memory questions. Such contrary results are consistent with the results of testing Hypothesis one.

Hypothesis five. There will be the same or significantly fewer high level written questions used by students taught by experimental group student teachers at the end of the student teaching experience than at the beginning.

Data presented in Table XIII show the statistical treatment for hypothesis five.

The Fisher exact probability test for hypothesis five resulted in no significant differences at the .05 level in the over time level of questions written by students taught by experimental group student teachers. The students appeared to maintain a pattern over time given individual differences. The differences found in the cognitive memory level were contrary to the predicted direction. The students wrote more low level questions at time two than expected.

Though not formally hypothesized, a parallel analysis was made on the control group student responses. The data presented in Table XIV show the statistical treatment for the control group student responses for hypothesis five.

The Fisher exact probability test resulted in no significant differences at the .05 level. Students taught by control group student teachers did not differ significantly regarding the proportion of questions written at three cognitive levels over two time periods. The students, given individual differences, maintained a pattern over time.

In order to see the middle time periods for the experimental and control group students analyzed in hypothesis five, additional data is presented in Tables XV and XVI. The data from these tables are presented as line graphs in Figures 3 and 4.

Data presented in Figure 3 show the results of charting the proportional values relative to the over three time period analysis of the experimental group students. The line representing response two reflects the highest overall proportion of higher than cognitive

TABLE XII
CHI-SQUARE TEST COMPARING THE PROPORTION OF QUESTIONS WRITTEN AT THE THREE COGNITIVE LEVELS BY THE TWO STUDENT GROUPS (N=36)

| Student Group | Proportion of Cognitive Memory Questions | | | | | |
|---|---|---|---|---|---|---|
| | High | | Low | | Totals | p |
| Experimental | 11 | (9) | 7 | (9) | 18 | |
| Control | 7 | (9) | 11 | (9) | 18 | |
| Totals | 18 | | 18 | | 36 | n.s. |

Chi-Square = 1.00 (Expected frequencies in parentheses)
.10 level = 2.706 for 1 df

| Student Group | Proportion of Convergent Questions | | | | | |
|---|---|---|---|---|---|---|
| | High | | Low | | Totals | p |
| Experimental | 6 | (9) | 12 | (9) | 18 | |
| Control | 12 | (9) | 6 | (9) | 18 | |
| Totals | 18 | | 18 | | 36 | .05 |

Chi-Square = 2.76 (Expected frequencies in parentheses)
.10 level = 2.706 for 1 df

| Student Group | Proportion of Divergent-Evaluative Questions | | | | | |
|---|---|---|---|---|---|---|
| | High | | Low | | Totals | p |
| Experimental | 6 | (9) | 12 | (9) | 18 | . |
| Control | 12 | (9) | 6 | (9) | 18 | |
| Totals | 18 | | 18 | | 36 | .05 |

Chi-Square = 2.76 (Expected frequencies in parentheses)
.10 level = 2.706 for 1 df

TABLE XIII

THE FISHER EXACT PROBABILITY TEST COMPARING THE PROPORTION OF QUESTIONS WRITTEN AT THE THREE COGNITIVE LEVELS BY EXPERIMENTAL (N=18) GROUP STUDENTS OVER TWO TIME PERIODS*

| Proportion of Questions Written Time 2 (Student Response 3) | Cognitive Memory Proportion of Questions Written Time 1 (Student Response 1) High | Low | Totals | p |
|---|---|---|---|---|
| High | 5 | 5 | 10 | |
| Low | 3 | 5 | 8 | |
| Totals | 8 | 10 | 18 | n.s. |

| Proportion of Questions Written Time 2 (Student Response 3) | Convergent Proportion of Questions Written Time 1 (Student Response 1) High | Low | Totals | p |
|---|---|---|---|---|
| High | 5 | 5 | 10 | |
| Low | 4 | 4 | 8 | |
| Totals | 9 | 9 | 18 | n.s. |

| Proportion of Questions Written Time 2 (Student Response 3) | Divergent-Evaluative Proportion of Questions Written Time 1 (Student Response 1) High | Low | Totals | p |
|---|---|---|---|---|
| High | 6 | 3 | 9 | |
| Low | 3 | 6 | 9 | |
| Totals | 9 | 9 | 18 | n.s. |

*A split of at least 7 and 2 with these marginals would be needed for significance at the .05 level for a one-tailed test.

TABLE XIV

THE FISHER EXACT PROBABILITY TEST COMPARING THE PROPORTION OF QUESTIONS WRITTEN AT THE THREE COGNITIVE LEVELS BY CONTROL (N=18) GROUP STUDENTS OVER TWO TIME PERIODS*

| Proportion of Questions Written Time 2 (Student Response 3) | Cognitive Memory Proportion of Questions Written Time 1 (Student Response 1) | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 8 | 1 | 9 | |
| Low | 1 | 8 | 9 | |
| Totals | 9 | 9 | 18 | .05 |

| Proportion of Q Questions Written Time 2 (Student Response 3) | Convergent Proportion of Questions Written Time 1 (Student Response 1) | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 4 | 5 | 9 | |
| Low | 5 | 4 | 9 | |
| Totals | 9 | 9 | 18 | n.s. |

| Proportion of Questions Written Time 2 (Student Response 3) | Divergent-Evaluative Proportion of Questions Written Time 1 (Student Response 1) | | | |
|---|---|---|---|---|
| | High | Low | Totals | p |
| High | 6 | 3 | 9 | |
| Low | 3 | 6 | 9 | |
| Totals | 9 | 9 | 18 | n.s. |

*A split of at least 7 and 2 with these marginals would be needed for significance at the .05 level for a one-tailed test.

TABLE XV

COMPARISON OF PROPORTION OF QUESTIONS WRITTEN BY EXPERIMENTAL GROUP STUDENTS BY LEVEL OF QUESTIONS OVER THREE TIME PERIODS

| Experimental Group Student Responses Numbers | Questioning Categories: Cognitive Memory Number | p | Convergent Number | p | Divergent and Evaluative Number | p | Total Questions |
|---|---|---|---|---|---|---|---|
| One 907 | 907 | .55 | 401 | .24 | 350 | .21 | 1658 |
| Two | 930 | .51 | 412 | .22 | 496 | .27 | 1838 |
| Three | 1151 | .60 | 266 | .14 | 506 | .26 | 1923 |
| Total Questions | 2988 | | 1079 | | 1352 | | 5419 |

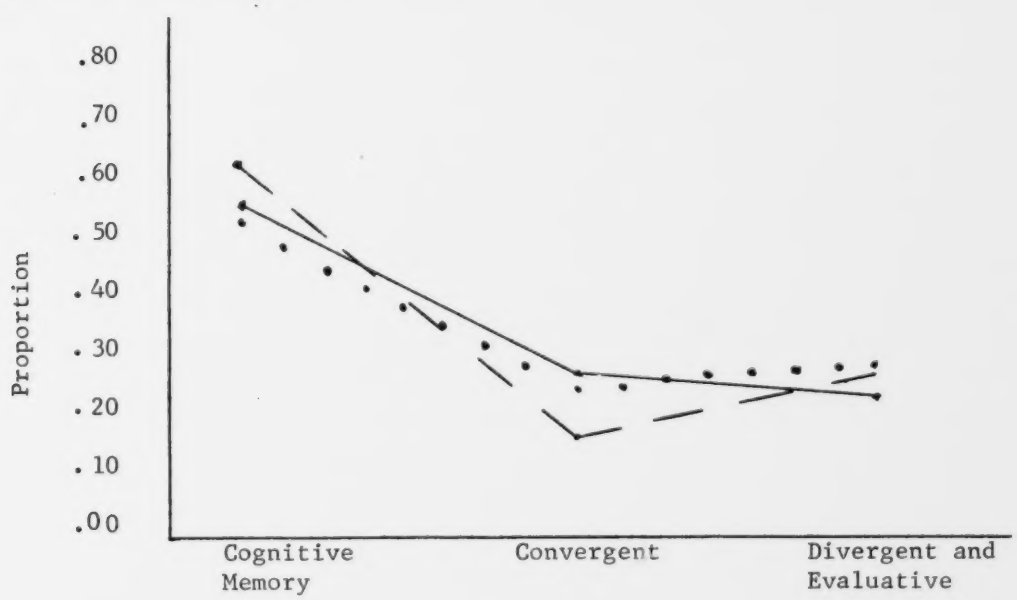



FIGURE 3

THREE TIME PERIOD QUESTION WRITING BEHAVIOR OF STUDENTS TAUGHT BY EXPERIMENTAL GROUP

TABLE XVI

COMPARISON OF PROPORTION OF QUESTIONS WRITTEN BY CONTROL GROUP STUDENTS BY LEVEL OF QUESTIONS OVER THREE TIME PERIODS

| Control Group Student Responses Number | Questioning Categories: Cognitive Memory Number | p | Convergent Number | p | Divergent and Evaluative Number | p | Total Questions |
|---|---|---|---|---|---|---|---|
| One | 653 | .44 | 423 | .29 | 396 | .27 | 1472 |
| Two | 671 | .44 | 304 | .20 | 545 | .36 | 1520 |
| Three | 771 | .44 | 356 | .21 | 599 | .35 | 1726 |
| Total Questions | 2095 | | 1083 | | 1540 | | 4718 |

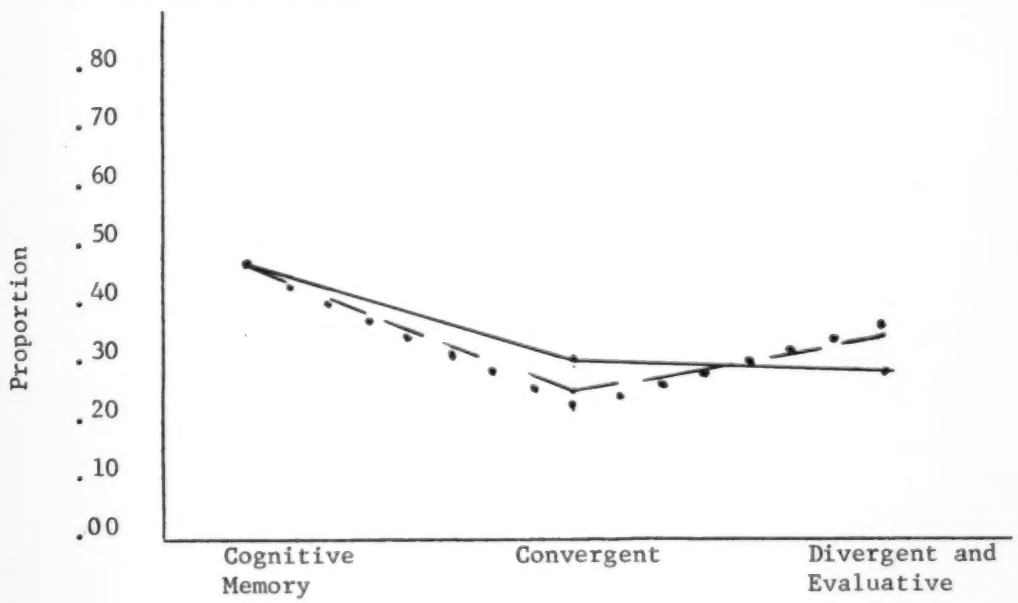



FIGURE 4

THREE TIME PERIOD QUESTION WRITING BEHAVIOR OF STUDENTS TAUGHT BY CONTROL GROUP

memory questions. The overall proportion of positive change in the divergent-evaluative category is off-set by the negative change regarding the convergent category, and the differences relative to the proportion of cognitive memory questions written on response three. Overall this appears to indicate a decrease over time in the proportion of higher level questions written by students in the experimental group.

The proportions in Figure 4 were the same for all three responses relative to the cognitive memory category. The decline in the proportion of questions written in the convergent category over time was off-set by the increase in the proportion of questions written in the divergent-evaluative category over the same period of time. Although students taught by student teachers in the control group evidenced a consistent questioning pattern over time, they did increase their proportion of questions in the highest category.

## Discussion

The results of the statistical treatment of the null hypotheses and related parallel investigations indicated that four of the five research hypotheses stated in Chapter I must be rejected. In some cases the results were contrary to that predicted. This discussion will be concerned with several possible reasons for the results occurring as they did. The reasons to be discussed are grouped as (1) sample and timing, (2) instrumentation, and (3) treatment.

The experimental and control samples of this study were drawn from the same student body in two different semesters and were found not to be significantly different on the control variables used. It is not the position of this writer that the use of additional control variables would have affected the results of the study.

A second possible reason for the results was that of instrumentation used in the investigation. The use of audio-tape recorders by the subjects on a pre-planned, though flexible, schedule may not have been the best way to obtain the most consistent questioning behavior pattern of the student teachers. The use of the recorders, or their scheduled use, may have caused some research contamination. It is the feeling of this writer that the use of the recorders on five different occasions off-set this contamination potential. When the over-two-time-period analysis of null hypothesis three and the parallel investigation of the control group are compared to the additional analysis over-three-time-periods, the presence and use of the recorder does not appear to have affected the results.

The statistics used, though not the most powerful, did provide the researcher with a means of reliably testing the research data and to retain sight of the individual research subjects. It does not appear that a different statistic would have significantly altered the results as presented.

The third possible reason for the results being as they were is that of the treatment used. Both the experimental and control groups received treatments with the experimental group receiving the independent variable of the video tape model. The results appear to indicate that the perceptual model had no effect or else a negative effect on the subjects. This does not discount the value of perceptual modeling, it just appears to place a limit on the overgeneralized use of the concept in teaching all instructional skills. The findings of this study supports the possibility that the questioning skill is not best taught by a short exposure to a perceptual model. Modeling did occur though as evidenced by a comparison of the student group responses to the student teacher results in each semester. The students modeled their student teachers if the written responses are indicative of teacher influence.

An alternative to the failure of the perceptual model to effect the desired change in the student teachers in this study is that the theory is correct and the perceptual model in this study was wrong. Had the model presented been film of a teacher working in a live classroom, the results of this study may have been different. The model as presented was apparently received as a college professor doing a professor kind-of-thing which the students watched but did not listen to the specific examples presented. A live teaching situation model might have caused the viewers to get involved with the total lesson and feel the adequacy or inadequacy of the questions as asked by both the teacher model and the students.

Inasmuch as this study was an investigation of one treatment versus another treatment, definitive conclusions must be withheld. Should the study be extended to include a student teacher group that received no questioning treatment, the conclusions could be more firm. The results of this study appear to indicate that (1) though not showing one treatment significantly better than the other, an impact was made on the questioning behavior of student teachers; (2) symbolic modeling of the questioning skill is a better instructional method than perceptual modeling; and (3) that students do model their teachers.

## Summary

Data relative to the pre-treatment control variables were analyzed and interpreted. The two groups of student teachers did not differ significantly on any of the control variables.

Five hypotheses relative to the questioning behavior of social studies student teachers and students in their classes were examined. Null hypotheses one, three, four, and five were accepted and null hypotheses two was rejected.

The differences found in the statistical analysis of the null hypotheses and in the parallel investigations appear to favor the

control group student teachers; students taught by the control group student teachers; and those student teachers who asked the fewer questions.

# CHAPTER V

## SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

### Introduction

The purpose of this chapter is to present a summary of the study, statements of conclusions based on the findings of the investigation, general recommendations for teacher education, and specific recommendations for further research.

### Summary

This study was designed to determine the effects of a perceptual modeling concept, presented during the pre-student teaching experience, on a specific verbal behavior of social studies student teachers during their student teaching experience. Within this framework the major purposes of the study were:

(1) To determine the effects of a perceptual modeling concept versus a symbolic modeling concept of a question categorizing system on the verbal behaviors of student teachers.

(2) To determine the effects subjects of this study have on the question writing practices of students they instruct during their student teaching experience.

The thirty-six subjects who comprised the sample of this study were those students enrolled in Education 431, Methods and Materials in Teaching Social Studies, at Fairmont State College. The students enrolled in Education 431 during the first semester served as the experimental group and those enrolled in the same course during the next semester served as the control group.

The experimental and control groups each received four periods of instruction regarding a modified Gallagher and Aschner questioning category system. The experimental group instruction was presented via video tape, prepared handouts, and discussion. The control group received four periods of instruction through the use of prepared handouts, discussion, and other verbal means only.

During the student teaching experience each student teacher's questioning behavior was audio taped for twenty minutes on each of five different occasions. Students in two classes taught by the subjects of this study, on three different occasions, wrote questions based on controlled information. The audio taping and student responses were scheduled during the early, middle, and later portions

of the eight week student teaching experience. There were 16,238 questions available for analysis of which 5,289 were transcribed from the audio tapes and 10,949 were written on the student response sheets.

Each question transcribed from the audio tapes and written on the student response sheets was categorized according to the modified Gallagher and Aschner categories. The categorized totals for both the experimental and control groups and students attending their classes were used to compute proportional values. The proportional values were statistically anlayzed by use of the chi square test and Fisher's exact probability test to determine the difference, if any, in the cognitive level of questions asked by the subjects of this study and written by the students attending their classes.

## Conclusions and Comments

1. It appears under the conditions of this investigation that the use of a perceptual model presented via video tape ensemble is not significantly more effective than a symbolic model presented via prepared handouts as an instructional technique for changing the oral questioning behavior of the social studies student teachers who were subjects of this study.

The results of the statistical analysis presented in Chapter IV regarding hypotheses one, three, four, and five appear to favor the control group, which received only a symbolic treatment, over the experimental group, which received the perceptual model treatment via a video tape ensemble. This conclusion strongly suggests caution in the overgeneralized use of the perceptual model concept in instructional skill development.

2. Student teachers in the experimental group asked a higher proportion of low level questions and a lower proportion of high level questions than student teachers in the control group.

Student teachers who received both the perceptual and symbolic model treatment asked a higher proportion of cognitive memory questions and a lower proportion of divergent-evaluative questions than expected whereas the student teachers who received only a symbolic model treatment asked a lower proportion of cognitive memory questions and a higher proportion of divergent evaluative than expected. This finding would appear to support the use of a symbolic model when structuring pre-student teaching question asking instruction in the social studies methods course.

3. Student teachers who ranked high on the total number of questions asked used a lower proportion of high level cognitive questions than those who ranked low on the total number of questions asked.

The evidence of this study indicates a significant difference in the proportion of high level questions asked when the student

teachers who asked the larger number of questions are compared to those who asked fewer questions. Those who asked fewer questions asked a higher proportion of high level questions. The same differences were found in the parallel investigations of the experimental and control groups.

4. Student teachers in the experimental group differed regarding their cognitive level of questions over time.

The evidence in this study indicates a decline over time regarding the differences found between the observed and expected proportions of convergent and divergent-evaluative questions asked by student teachers in the experimental group over the total student teaching experience. The decline was most severe between time one and time two with the group showing an increase toward their initial questioning levels on three. Had the experience been longer, the experimental student teachers may have reflected an overall increase in their use of higher level questions.

5. Student teachers in the control group differed over time regarding their cognitive level of questioning.

A parallel investigation of this study indicates that the differences, though slight, reflect an increase in the proportion of oral divergent-evaluative questions and a decrease in the proportion of oral cognitive memory questions asked by student teachers in the control group over the total student teaching experience.

6. Students taught by control group student teachers appeared to write questions on their response sheets at a higher cognitive level than students taught by experimental group student teachers.

Under the conditions of this investigation, there appeared to be a significant advantage to being taught by student teachers in the control group. Students in this group wrote high level questions at a proportion of .55 compared to a proportion of .45 for students taught by student teachers in the experimental group. Consistency was noted in the writing practices of the students when compared to the question asking practice of their student teachers.

7. Students taught by experimental group student teachers evidenced a slight decrease over time relative to the cognitive level of their written questions.

The evidence available indicated that the proportion of questions above the cognitive memory level which were written by students in classes taught by experimental group student teachers decreased slightly over the time between the first student responses and the third student responses. This student behavior is consistent with that of their student teachers indicating that the students imitated the teacher model.

8. Students taught by control group student teachers reflected an increase over time regarding the cognitive level of their written questions.

The questions written by students in the cognitive memory category remained constant over time. The proportion of questions written in the convergent category declined but the decline was absorbed in the increase in the proportion of divergent-evaluative questions that were written. The student questioning behavior was consistent with that of their student teachers.

9. Even when trained, student teachers ask questions other than those classified in the cognitive questioning categories.

A total of 5,289 student teacher questions were transcribed in this study. Of this total, 4,765 or 90 percent were categorized in the cognitive categories and 524 or 10 percent were classified as others. A total of 10,949 questions were written by students of which 10,137 or 93 percent were categorized in the cognitive categories and 812 or 7 percent were classified as others. Overall there were 16,238 questions categorized of which 8 percent were others. This large number of questions would appear to lend much stability to the findings of this study.

## Recommendation for Teacher Education

On the basis of the results of this study and the literature reviewed, the following general recommendation is proposed for social studies education programs.

Prior to making changes in the curriculum and purchasing equipment it is important to know the purposes and results of research such as that reviewed for this study and whether or not such purposes and results fit the needs of a local program and its contributing population. The move to a curriculum of performance based units or the purchasing of media such as video tape ensembles, overhead projectors and movie projectors, requires much investigation. Care must be exercised to provide inservice programs for the professional staffs of both the cooperating schools and the colleges to insure their willingness to work in the new curriculum programs and to maximize the preservice and inservice potential of the available multi-media programs.

## Recommendations for Further Research

Based upon the problems encountered and the results obtained in this study, the following recommendations are set forth as considerations for further study and investigation.

1. This study used as subjects student teachers from one content area. The study needs to be replicated using subjects from

the four content areas of social studies, language arts, mathematics and science.

2. Research is needed to determine the immediate impact and the long-range effect various oral questioning practices of teachers and student teachers have on the imitative behavior of their students.

3. This study needs to be replicated with inservice social studies teachers to determine if this is an effective means for shaping their questioning behavior.

4. A research design is needed to determine the relationship, if any, among the cognitive level of (1) the instructional objectives, (2) oral classroom questions, and (3) the questions used on evaluation instruments, by both preservice and inservice social studies teachers.

5. Retaining the basic research design of this study, the following are in need of exploration:

a. Increasing the number of treatment sessions
b. Increasing the number of examples presented by the perceptual model
c. Altering the format of the perceptual model presentation
d. Developing the perceptual persentation with a live audience
e. Developing a reinforcement versus no reinforcement schedule for use during student teaching
f. Increasing the amount of time given to practicing asking questions, perhaps using micro-teaching designs.

6. A research design is needed to explore the oral questioning behavior of open and closed-minded students after treatment and when assigned to open and/or closed-minded cooperating teachers.

7. Further research should be conducted to determine whether the pre-treatment control variables of this study have any individual or collective potential for predicting oral questioning behavior of student teachers.

8. An extension of the present study to include a control group that would receive no questioning instruction is needed to assist in interpreting the value of treatments used in this study.

9. Research is needed in other instructional skill areas to help determine if the perceptual model concept has been overgeneralized in its use in teacher education programs.

10. A follow-up study on subjects of this research is needed to determine the changes, if any, they evidence regarding the cognitive level of their oral classroom questions as inservice teachers.

11. A research study is needed to investigate the effect the maturation level of students has on the level of questions they write or ask on each grade level and/or in each level of social studies instruction.

12. Research is needed to help determine effective questioning techniques for use in social studies values areas.

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# APPENDIX A

## PERSONAL DATA AND AUTHORIZATION FORM

EDUCATION 431

METHODS AND MATERIALS IN TEACHING SOCIAL STUDIES

Personal Data and Authorization Form

Name_____

Sex_____ Age _____

Marital Status_____ Overall grade point average _____

MTAI_____TSRT_____ D-Scale_____

This is to authorize William E. Phillips, Jr. to use the following information in an experimental study:

1. Information from the Personal Data and Authorization Form.

2. Information collected during the student teaching experience via audio tape recordings and student response sheets.

_____
(Signature)

# APPENDIX B

## TEACHING SITUATION REACTION TEST

# TEACHING SITUATION REACTION TEST

Revised September, 1966

Directions: The case example that follows has been planned to measure your ability to work through some of the problems of handling a classroom group. You will be given certain information about the classroom group and the working situation. You will then be asked to respond to a number of questions. This will be repeated through a series of problem situations. The case study has been designed so that you can respond regardless of your teaching subject field. You do not need technical subject matter knowledge to take this test.

You are asked to indicate your first, second, third, and fourth choice under each question by inserting respectively the numbers 1, 2, 3, 4, in the spaces provided on the answer sheets under (a) (b) (c) and (d). The most desirable choice should be labeled 1, and the least desirable 4. For example if your first choice was response (c), your second choice was response (a), your third choice was response (b), and your fourth choice was response (d), you would record your responses on the answer sheet as follows:

| (a) | (b) | (c) | (d) |
|---|---|---|---|
| 2 | 3 | 1 | 4 |

Please do not write on the test booklet.

The Situation:

You have been employed by a school system which is engaged in a series of experimental studies. One of these studies involves an experimental class designed to improve pupils' general adjustment to their environment. A heterogeneous group (Physically, mentally socially) of twenty-five thirteen to fourteen year old youngsters have signed up for this class.

The class is scheduled to meet the last period of the day on Tuesday and Thursday during the last half year. Arrangements have been made so that the class might take trips and students might have an opportunity to meet informally with the teacher after class.

Around the first of November your principal calls you in to tell you that, if you are interested, you have been chosen to teach the experimental class. You were asked because of your background in adolescent psychology and your interest in helping youngsters with minor problems of adjustment typical of the young adolescent.

Your principal has given you pretty much of a "free hand" to develop the content of the course and the activities in which the students will be engaged. A good supply of instructional materials, books on the adolescent, and the descriptions of similar problems in other schools has been made available to you. There will be no direct supervision of your work, but an evaluation by students and your self will be requested at the middle and close of the semester. Studies will also be made of the gain in personal adjustment evidenced by your students. You know the names of the students who have signed up for your course. An experienced teacher-counselor has been asked by the principal to help you when and if you ask for help. The teacher-counselor knows well each of the youngsters who have signed up for your class.

The Group:

Some of the youngsters who have signed up for the course know each other very well, having gone through school together. Three do not know anyone else in the group. Others are only casually acquainted. Members of the group have a variety of interests and abilities, and they represent many levels of competence and come from a variety of socio-economic backgrounds. The quality of their personal adjustment varies, but none is seriously maladjusted.

A. You have about eight weeks plus the Christmas vacation to plan for your class.

1. When you begin planning the course you would:

   (a) Ask your teacher-counselor what he thinks should be in the course.

   (b) Examine the materials available to you and determine how they might be used by members of the class.

   (c) Read through the copies of publications describing other school programs of a similar nature and draw ideas from them.

   (d) Interview a randomly selected group of the young people signed up for the course and set your own tentative objectives based on those interviews.

2. During early December an important local civic group comes out against teaching sex education in the schools. Your planning had included some sex education. At this point in your planning you would:

   (a) Continue planning as you have been.

   (b) Ask the principal if you should include any sex education in your course.

   (c) Remove the lessons dealing with sex education.

   (d) Find ways to get the sex education materials across without causing an issue.

3. About three weeks before your class is scheduled to meet for the first time, your principal asks you to come in and talk with him about the course. You would hope that your principal would:

   (a) Say that if there was anything that he could do to be of help that you should be free to call on him.

   (b) Indicate to you what he would hope the course would accomplish during the semester.

   (c) Encourage you to talk about the purposes of your course as you see them after several weeks of planning.

   (d) Make specific suggestions to help you in your planning, and encourage you to drop in for further suggestions if you need help.

4. The weekend before the course is to start it would be natural for you to feel:

   (a) concern that your planning has been inappropriate.

   (b) anxious to get started and prove your ability to handle this rather difficult assignment.

   (c) hopeful that the course will prove of real value to the students.

   (d) confident knowing you have done the best you could under the circumstances.

B. You will have your first meeting with the group tomorrow.

5. It will be important that you have planned for:

   (a) students to get well acquainted with each other.

   (b) explaining your grading system.

   (c) activities to catch student interest.

   (d) explaining your complete program for the semester.

6. The teacher-counselor drops by your room and asks if he can be of help. You would ask him for:

   (a) his opinion about what you have planned for tomorrow.

   (b) suggestions to help you make a good impression.

   (c) suggestions as to what student reaction might be on the first day.

   (d) nothing until you had an opportunity to meet with the group.

7. The more important personal information to gather at the first meeting would be:

   (a) interests of the different students.

   (b) parent or guardian, home address and phone number.

   (c) what the students would like to do in the course.

   (d) why they are taking the course.

8. Of the things you would do the evening before meeting the class, the most essential would be to:

   (a) become familiar with the notes for such presentations as you might make.

   (b) become familiar with students' names and any information you have about them from their files.

   (c) become familiar with the sequence and nature of any activities you may have planned.

   (d) be sure any materials you were to use were available and in good condition.

9. Your greatest concern on this night before the first meeting would be:

   (a) how to appear poised and at ease.

   (b) how to gain control of the group.

   (c) how to handle problem pupils

   (d) how to get your program moving rapidly and well.

C. On meeting the group the first day a number of students come in from three to five minutes late. Following this, as you get your program underway the students get restless.

10. With the students that come in late you would:

   (a) Simply acknowledge their presence and noticeably mark them present in the record book.

   (b) inform them politely about the time at which the class starts.

   (c) ask them politely why they were unable to get to class on time.

   (d) make clear to the class as a whole and the late students in particular the standards you will maintain with regard to tardiness.

11. You would handle the restlessness of the group by:

   (a) presenting your program more dynamically.

   (b) asking students why they were restless.

(c) speaking to the group firmly about paying attention.

(d) picking out one or two of the worst offenders and reprimanding them.

12. You would tell the group your name and:

(a) the rules of conduct for your class.

(b) your expectations for the class.

(c) some of your personal adjustment problems at their age.

(d) some of your interests and hobbies.

13. You would, by your general behavior and manner, try to present yourself as:

(a) firm and serious but fair.

(b) efficient, orderly and business-like.

(c) friendly, sympathetic and understanding.

(d) understanding, friendly and firm.

14. You would prepare for the next meeting by:

(a) discussing with pupils what they would like to do and deciding on one or two ideas.

(b) telling them what pages to read.

(c) giving students a choice of two ideas and determining in which majority they are interested.

(d) discussing your plans for the next meeting with them.

D. You have met with your class four times and have made some observations. Two boys seem particularly dirty and you have found they come from a lower class slum area. One girl seems to be withdrawn. The students do not pay any attention to her. She is a pleasant looking well dressed girl. There are four or five youngsters, apparently very good friends (both boys and girls) who do most of the talking and take most of the initiative. Students seem to continually interrupt each other and you.

15. In the interests of the two boys from the slum area you would:

    (a) find an opportunity to discuss the matter of cleanliness with the class.

    (b) speak to the boys about their need to be clean in a conference with them.

    (c) inaugurate a cleanliness competition with a prize to that half of the class with the best record, putting one boy in each half.

    (d) speak to the boys about their need to be clean and arrange facilities at school where they could clean up.

16. In the interests of the apparently withdrawn girl you would:

    (a) talk to her informally over a period of time to see if you could determine her difficulty.

    (b) call on her regularly for contributions to the discussion.

    (c) discover a skill she has and have her demonstrate for the class.

    (d) have a conference with her and tell her to become involved with the class discussion and speak up.

17. To improve the relationship of the group to the apparently withdrawn girl you would:

    (a) determine who, if anyone, is friendly with her and arrange to have them work together on occasion.

    (b) take the girl aside and help her see how she can establish better relations with her classmates.

    (c) arrange to have her work with the group of boys and girls who take most of the initiative.

    (d) allow her to work out her own problem.

18. With regard to the four or five youngsters who do most of the talking and take the initiative you would tend to believe:

    (a) they are brighter than most of the other students.

(b) they are the leaders of the class.

(c) there is considerable variation in student's ability to participate in class.

(d) they are a little too cocky and think they know more than the others.

19. With regard to the tendency of class members to interrupt while others are talking you would:

(a) tell the class politely but firmly that interruptions are impolite and should not continue.

(b) discuss the matter with the class, determining why this happens and what should be done about it.

(c) organize a system of hand raising and set rules for students participation in discussion.

(d) set rules for student participation in discussion and firmly but fairly reprimand each person who breaks the rules.

20. One of the important problems facing you now is to do something which:

(a) will insure that no one is rejected or disliked.

(b) will result in everybody's being liked.

(c) will encourage each person's acceptance of the others.

(d) will guarantee that no one's feelings get hurt.

E. At the beginning of the eighth class session (fourth week) Johnny comes into class holding on to his arms and very nearly crying. The tears are welled up in his eyes and he looks away from the others. You notice that Peter, the largest and strongest boy in the class, looks at Johnny occasionally with a sneering smile. You do not feel that you can let this pass, so you arrange to meet with Johnny and Peter separately after class.

21. You would tend to believe:

(a) that Johnny probably did something for which this was just, but maybe severe, payment.

(b) that Peter is something of a bully.

(c) that Johnny was hit on the arm by Peter.

(d) that Johnny felt badly and Peter was quite aware of it.

22. When you meet with Johnny you would:

(a) ask him if Peter hit him and why.

(b) engage him in conversation and lead slowly into the difficulty he had that afternoon.

(c) tell him you were aware that he had some difficulty and offer your help to him.

(d) let him guide the discussion and reveal what he would about the incident.

23. When you meet with Peter you would:

(a) tell him that Johnny was upset this afternoon and you had noticed that he (Peter) was looking strange--proceed from there.

(b) make him aware that you know he had trouble with Johnny and proceed from there.

(c) make him aware that he is bigger and stronger than the other boys and that he is a bully if he picks on smaller boys.

(d) ask him if he and Johnny had had difficulty.

24. When young people get into conflict in school it would be best to:

(a) let them resolve it themselves.

(b) help them to establish a friendly relationship.

(c) find the cause of the trouble and work to eliminate it.

(d) control the school situation so that the conflicts are less likely to arise.

F. In general your program has been moving along satisfactorily. After the eighth meeting you have a feeling that the students are beginning to lose interest. A number of students seem to be sitting through class without really getting involved.

Others seem to stay interested and active. The teacher-counselor asks to see you informally over coffee.

25. When you meet with the teacher-counselor you would:

    (a) not talk about your class or its present lack of involvement.

    (b) discuss your concern with him and listen for suggestions he might have.

    (c) speak about how satisfactory the early meetings have been.

    (d) allow the teacher-counselor to orient the discussion.

26. Your planning for the next (ninth) session would include:

    (a) some new ideas that you had not tried.

    (b) some clarification of the importance of students doing well in their work.

    (c) a request for ideas from students as to how to make the class more interesting.

    (d) ways to get more students actively doing something in class.

27. During the ninth session you would:

    (a) behave much as you had in earlier sessions.

    (b) put some stress on the importance of everybody paying attention in class.

    (c) by careful observation determine which students seem disinterested.

    (d) speak pointedly to those who were not paying attention.

28. You would tend to believe the loss of interest due to:

    (a) a rather natural reaction in an elective experimental course.

    (b) failure of students to realize that they must contribute much to a course of this kind.

    (c) a rather natural group reaction to the experience of working together on personal adjustment problems.

(d) your own failure in developing good human relationships in the class and stimulating the students.

G. Before the mid term (eighteenth) meeting of the class you take time out to think about the experiences you have had. The class has been good some days and poor other days. You have had no word from your principal about how your work has been. The teacher-counselor has seemed satisfied but not very much impressed with what you are doing. You have heard noting about the young people who are being studied. You are asked to meet with the parents to discuss the experimental class in an informal way.

29. You would be most concerned about:

(a) the failure of the principal and teacher-counselor to discuss the progress of the students before your meeting with the parents.

(b) what you should say to the parents.

(c) your apparent failure to impress your teacher-counselor.

(d) what the studies of the young people are showing.

30. You would resolve to:

(a) discuss your progress with the teacher-counselor.

(b) ask for an appointment with the principal to find out how he feels about your work.

(c) plan to work harder with your group.

(d) not let the present state of affairs worry you.

31. When talking with the parents you would:

(a) encourage them to ask questions about the program.

(b) tell them what the program has consisted of so far.

(c) tell them you don't know how well the program is going.

(d) impress upon them the importance of student participation in class activities.

32. In this case you would feel that parents:

(a) ought to be told how their children are doing in this class.

(b) ought not to become involved in such an experimental program.

(c) are entitled to an opportunity to question you.

(d) ought to be referred to those in charge of the experiment.

33. At your next class meeting:

(a) you would tell students what you told their parents.

(b) you would not initiate any discussion about your visit with the parents.

(c) you would discuss briefly the parents' interest in the class.

(d) you would tell the students that you expected more cooperation from them now that their parents were involved.

H. The nineteenth and twentieth class sessions are very unsatisfactory. You leave class at the end of the twentieth session with doubts in your mind as to whether students are gaining in personal and social adjustment. You can see problems with the structure and organization of the class and believe that if these would be corrected or if you had done some things differently over the past few weeks that you would not have a problem with the class.

34. At this point you would:

(a) decide to go to class the next day and ask your students how they feel about the progress of the course.

(b) think through the problem carefully and start planning revisions for the course next year.

(c) try to help yourself accept the fact that life is often filled with disappointments and redouble your efforts to make your class better in the future by spending more time in preparation and encouraging your students to work harder.

(c) ask the teacher-counselor to come in and observe the class several times and talk with you about his observations.

(d) consult the records of the students to see if you could find any clues there.

I. At your twenty-fourth meeting you wish to make plans for a series of visits to different community health and welfare agencies. You want to be sure that the youngsters learn from the experiences and conduct themselves properly while traveling to and from and visiting in the agencies.

38. In order to assure that all youngsters learned from their first trip you would:

(a) assign particular things for all of them to look for and listen to.

(b) ask each to write a brief commentary on the most important things they saw and heard.

(c) encourage them to ask questions while they were there.

(d) present them with a check sheet of items to be seen and heard and ask them to check off those that they saw or heard.

39. In preparation for the first trip you would:

(a) tell them as much as you could about the agency to which they were going.

(b) tell them you were sure it would be interesting and fun and let them see and hear for themselves.

(c) ask them what they thought they could expect and encourage guided discussions about their expectations.

(d) tell them about the most interesting things they would see and hear.

40. To insure that the group conducted themselves properly you would:

(a) set out rules of conduct for them.

(b) ask them to behave as young ladies and gentlemen representing their school.

(c) ask them what rules of conduct they would propose and develop a code with the group.

(d) assure them that if they did not behave properly they would not go on trips in the future.

41. On the trips you would:

(a) divide them into small groups with a leader responsible for each group and arrange their itinerary and meetings after you get to the agency.

(b) ask the youngsters to get your permission first and on this basis allow them to pursue their own interests.

(c) let the agency people take responsibility for deciding where they could go and when.

(d) keep them all together as a manageable group.

J. At the close of the thirtieth class session Bob, one of the most able boys, summarizes a class discussion on boy-girl relationships with, "Well, we've talked around the subject but we never get down to the important questions." The agreement of a number of class members is evident.

42. You would tend to believe:

(a) the class members are too young to be dealing with important questions in this area.

(b) you had allowed just a little too much freedom in discussions of boy-girl relationships.

(c) this simply reflects a natural desire on the part of students to introduce some excitement into class sessions.

(d) the class could handle important questions in this area with your guidance and support.

43. Before the thirty-first session you would:

(a) clarify the significance and implications of Bob's statement in your own mind.

(b) determine what you will and will not allow to be discussed in class in this area.

(c) consult the principal and get direction from him.

(d) discuss the situation with the teacher-counselor with a view to getting ideas for handling the next session.

44. During the thirty-first session you would:

(a) propose a list of carefully selected questions you believe the students have in mind and begin discussions on the most manageable of these.

(b) repeat Bob's comment and draw from the class a list of what they thought should be discussed.

(c) suggest that some questions are not appropriate for discussion in school and that some of these fall in the area of boy-g rl relationship.

(d) ask Bob to pick up where he left off and guide him and other class members as they clarify the directions further discussion should take.

K. Your class has at last developed into a fairly cohesive unit. The discussions are more animated and everyone participates to some degree. Disagreements on ideas begin to appear and the students give evidence of intense feelings on a number of issues. George has been particularly outspoken. He has very radical ideas that seem to provoke the other students to disagree but you know that the ideas he expresses have some support from some adolescent psychologists that you consider to be the "lunatic fringe". George seldom gives in on a point.

45. You would believe that these conditions are likely to:

(a) ultimately strengthen the group.

(b) do little but make it uncomfortable until George learns his lesson.

(c) destroy the group unity unless you intervene.

(d) make it difficult for progress to be made for some students until they learn to accept George.

46. With regard to George you would:

(a) refer him to the teacher-counselor.

(b) point out to George that he is intolerant of the views of other class members.

(c) encourage him to express his ideas in ways that would not irritate other students.

(d) politely but firmly keep him from expression of such ideas.

47. With regard to the other students you would:

(a) encourage them in their effort to stand up to George.

(b) help them to understand what George is doing to them and why.

(c) help them to get onto topics and ideas where George could not disagree with them so forcefully.

(d) get into the discussion on their side and show George that he is wrong.

48. With regard to your concern for George as a person, you would feel that:

(a) he is developing undemocratic traits by behaving as he does, and you would hope to help him change.

(b) he does not understand how to behave in a democratic setting and may need help.

(c) he probably has never learned certain social skills necessary for democratic group behavior and the possibilities of developing such skills should be shown him.

(d) he will learn sooner or later that in a democracy some ideas are undesirable because they tend to destroy the group.

Answer Sheet

TEACHING SITUATION REACTION TEST

Name_____ Number_____ Date_____

| | | |
|---|---|---|
| 1. a b c d | 17. a b c d | 33. a b c d |
| 2. a b c d | 18. a b c d | 34. a b c d |
| 3. a b c d | 19. a b c d | 35. a b c d |
| 4. a b c d | 20. a b c d | 36. a b c d |
| 5. a b c d | 21. a b c d | 37. a b c d |
| 6. a b c d | 22. a b c d | 38. a b c d |
| 7. a b c d | 23. a b c d | 39. a b c d |
| 8. a b c d | 24. a b c d | 40. a b c d |
| 9. a b c d | 25. a b c d | 41. a b c d |
| 10. a b c d | 26. a b c d | 42. a b c d |
| 11. a b c d | 27. a b c d | 43. a b c d |
| 12. a b c d | 28. a b c d | 44. a b c d |
| 13. a b c d | 29. a b c d | 45. a b c d |
| 14. a b c d | 30. a b c d | 46. a b c d |
| 15. a b c d | 31. a b c d | 47. a b c d |
| 16. a b c d | 32. a b c d | 48. a b c d |

# APPENDIX C

## FORM E OF THE DOGMATISM SCALE

## THE D-SCALE

The following is a study of what the general public thinks and feels about a number of important social and personal questions. The best answer to each statement below is your personal opinion. We have tried to cover many different and opposing points of view; you may find yourself agreeing strongly with some of the statements, disagreeing just as strongly with others, and perhaps uncertain about others; whether you agree or disagree with any statement, you can be sure that many people feel the same as you do.

Read each statement and then mark the corresponding number beside the statement according to how much you agree or disagree with it. Please mark every one. Write +1, +2, +3, or -1, -2, -3, depending on how you feel in each case.

| | | | |
|---|---|---|---|
| +1: | I AGREE A LITTLE | -1: | I DISAGREE A LITTLE |
| +2: | I AGREE ON THE WHOLE | -2: | I DISAGREE ON THE WHOLE |
| +3: | I AGREE VERY MUCH | -3: | I DISAGREE VERY MUCH |

_____ 1. The United States and Russia have just about nothing in common.

_____ 2. The highest form of government is a democracy and the high-form of democracy is a government run by those who are most intelligent.

_____ 3. Even though freedom of speech for all groups is a worth-while goal, it is unfortunately necessary to restrict the freedom of certain political groups.

_____ 4. It is only natural that a person would have a much better acquaintance with ideas he believes in than with ideas he opposes.

_____ 5. Man on his own is a helpless and miserable creature.

_____ 6. Fundamentally, the world we live in is a pretty lonesome place.

_____ 7. Most people just don't give a "damn" for others.

_____ 8. I'd like it if I could find someone who would tell me how to solve my personal problems.

_____ 9. It is only natural for a person to be rather fearful of the future.

_____10. There is so much to be done and so little time to do it in.

_____11. Once I get wound up in a heated discussion I just can't stop.

_____12. In a discussion I often find it necessary to repeat myself several times to make sure I am being understood.

_____13. In a heated discussion I generally become so absorbed in what I am going to say that I forget to listen to what the others are saying.

_____14. It is better to be a dead hero than to be a live coward.

_____15. While I don't like to admit this even to myself, my secret ambition is to become a great man, like Einstein, or Beethoven, or Shakespeare.

_____16. The main thing in life is for a person to want to do something important.

_____17. If given the chance I would do something of great benefit to the world.

_____18. In the history of mankind there have probably been just a handful of really great thinkers.

_____19. There are a number of people I have come to hate because of the things they stand for.

_____20. A man who does not believe in some great cause has not really lived.

_____21. It is only when a person devotes himself to an ideal or cause that life becomes meaningful.

_____22. Of all the different philosophies which exist in this world there is probably only one which is correct.

_____23. A person who gets enthusiastic about too many causes is likely to be a pretty "wishy-washy" sort of person.

_____24. To compromise with our political opponents is dangerous becuase it usually leads to the betrayal of our own side.

_____25. When it comes to differences of opinion in religion we must be careful not to compromise with those who believe differently from the way we do.

_____26. In times like these, a person must be pretty selfish if he considers primarily his own happiness.

_____27. The worst crime a person could commit is to attack publicly the people who believe in the same thing he does.

_____28. In times like these it is often necessary to be more on guard against ideas put out by people or groups in one's own camp than by those in the opposing camp.

_____29. A group which tolerates too much differences of opinion among its own members cannot exist for long.

_____30. There are two kinds of people in this world: those who are for the truth and those who are against the truth.

_____31. My blood boils whenever a person stubbornly refuses to admit he's wrong.

_____32. A person who thinks primarily of his own happiness is beneath contempt.

_____33. Most of the ideas which get printed nowadays aren't worth the paper they are printed on.

_____34. In this complicated world of ours the only way we can know what's going on is to rely on leaders or experts who can be trusted.

_____35. It is often desirable to reserve judgment about what's going on until one has had a chance to hear the opinions of those one respects.

_____36. In the long run the best way to live is to pick friends and associates whose tastes and beliefs are the same as one's own.

_____37. The present is all too often full of unhappiness. It is only the future that counts.

_____38. If a man is to accomplish his mission in life it is sometimes necessary to gamble "all or nothing at all."

_____39. Unfortunately, a good many people with whom I have discussed important social and moral porblems don't really understand what's going on.

_____40. Most people just don't know what's good for them.

# APPENDIX D

## THE USE OF QUESTIONS AS A TEACHING TECHNIQUE

EDUCATION 431

Methods and Materials in Teaching Social Studies

## THE USE OF QUESTIONS AS A TEACHING TECHNIQUE

As we continue our work with micro skills of teaching, we now direct our effort toward that of questioning. The word question will be used to refer to any intellectual exercise that requires a response; this would include both problems and projects.

The inability to use the art of questioning as a teaching technique has been a consistent problem for many student teachers. Some may hold to the idea that the skill to properly use questions comes with maturity but this is not true. A teacher wishing to use questioning as an aid will need to perfect the art through training.

The initial step toward developing the ability to question students more purposefully might be that of establishing a list of purposes that questioning could help a teacher and/or student accomplish. The following is an example of such a list (Callahan, 1966, p. 200):

1. Stimulate analytical thought
2. Diagnose student difficulties
3. Determine progress toward specific goals
4. Motivate students
5. Clarify and expand concepts
6. Encourage new appreciations and attitudes
7. Give specific direction to thinking
8. Relate cause to effect
9. Encourage student self-evaluation
10. Encourage the application of concepts

A study of such a list of purposes clearly indicates that while we need to question across the total continuum of cognitive memory, convergent, divergent, and evaluative thinking, an analysis of most classrooms would indicate that we spend most of our time with cognitive memory type questions. We do not want to eliminate these basic knowledge or memory type questions but suggest that more use be made of other points on the continuum. Through their use we can cause students to probe deeper; develop analytical thinking; and to evaluate and defend.

If we feel posititve toward wanting to improve our art of questioning, we find the information which follows of significant value. Research by Gallagher and Aschner (1963, pp. 183-194) resulted in a category system constructed primarily on the operations of intellect as described by Guilford (1956, pp. 267-293). The four primary categories, preliminary definitions, and examples of questions in each category follows.

1. Cognitive memory - Questions in this category are designed to call forth specific facts, formulae, or other items of remembered content through the use of such processes as recognition, rote memory, and selective recall. The teacher expects answers drawn directly from the students memory bank. Examples of such questions are:

a. Who were the first five Presidents of the United States?
b. What is the definition of constituent?
c. List the major ideas we went over yesterday.
d. What did we say the first step is in our problem solving scheme?
e. Who was the major author of the Declaration of Independence?

2. Convergent - Questions in this category are designed to call forth responses that require analysis or integration of given or remembered data. The answer will be tightly structured and given within a specific framework. Convergent questions can be involved in the solving of a problem, summarizing a body of materials, or in establishing a logical sequence of ideas or premises. There is usually a right answer which the teacher expects the student to reason out by using a previously learned idea such as a skill, definition, principle, or generalization. Use of such ideas requires the transfer of training to new situations called for by the problem. Examples are:

a. Can you sum up the main ideas in chapter ten?
b. Draw three pictures showing how the butcher could use money in each of its three functions.
c. Would the standard of living of a country be a good index of its power in international affairs? Tell why.
d. What characteristics of capitalism are violated in this situation?
e. With what bag of fertilizer does production peak?

3. Divergent - Divergent questions are designed to cause students to generate new data, formulate hypotheses, or develop a novel solution to a given problem. The students are free to generate their own data in data poor situations or to take new directions or perspectives. The student might generate, formulate, or develop physical objects, communications, plans of operations, or sets of abstract relations. The results will not be one correct response but many good answers which students may work out in a creative and imaginative way. Examples of divergent questions are:

a. If winter had not set in when it did, what might have been the results of the German invasion of Russia?
b. Based on the economic statistics which you feel most appropriate, develop your own definition of a have-not nation. Use your definition to identify the fifteen nations in the world that most fully meet your criteria for the have-not status.

c. What would our clothing habits be like if cotton was not available?
d. What might be the reason their economy is operating as it is?
e. Identify and support what you feel to be the major problem of our society.

4. Evaluative - Evaluative questions are designed to cause students to make judgments, express their values or opinions of some product, communication, event, or situation. The student must construct his own standards of evaluation and evaluate according to these standards. Examples are:

a. Which of the following occupations has the most prestige? Why?
b. Was Patton or Clark the better general? Support your conclusion.
c. Is a bail of $10,000 fair to rich and poor alike? Defend.
d. Which branch of the Federal Government is the most important? Tell why.
e. Why should there be diplomatic relations between the major nations of the world? Support your answer.

# APPENDIX E

## PRACTICE IN CLASSIFYING QUESTIONS

EDUCATION 431

Methods and Materials in Teaching Social Studies

PRACTICE IN CLASSIFYING QUESTIONS

Indicate which of the Gallaghner-Aschner categories is illustrated by each of the following questions. (If you think that it could be in two categories, list the most probable first.)

1. Conditions for this question: The students in a citizenship class have studied procedures of arrest and trial. Bail has been defined.

Question: A rich man and a poor man are arrested on suspicion of committing murder. Bail is set for $10,000 each. Is this fair? Tell why.

Category_____

2. Conditions for this question: The students have learned how to make bar graphs, line graphs, circle graphs, and pictographs. The teacher presents statistics on the gross national product for the United States from 1900 to present.

Question: Use a line graph to present this data.

Category_____

3. Conditions for this question: A geography class has invited a foreign visitor in the community to meet with the class.

Question: Draw up a list of questions which would be appropriate to ask of our visitor.

Category_____

4. Conditions for this question: The students in a world history class have studies excerpts from writings by Herodotus and Thucydides. The teacher divides the class into small discussion groups and asks each group to try to reach a consensus on the following question.

Question: Was Herodotus or Thucydides a better historian? Give the reasoning to support your conclusion.

Category_____

5. Conditions for this question: Early in a school year a teacher described proper methods of taking lecture notes.

Question: Later in the year the teacher gives a lecture and without announcing his intention in advance asks students to turn in their lecture notes for evaluation.

Category_____

6. Conditions for this question: The teacher has given a lecture describing the "balance of payments" problem of the United States. The following essay question is presented on a semester exam.

Question: What is the "balance of payment" problem of the United States?

Category_____

7. Conditions for this question: The students have read a description of the "domino theory" in reference to Southeast Asia.

Question: Draw a diagram of the domino theory. Show dominos lined up so if the first one is knocked over the other will fall. Label each domino with the name of a country in Southeast Asia. Show a big finger labeled "Oppressor" ready to push over the first domino.

Category_____

8. Conditions for this question: A United States History class has studied factors to be considered in determining the reliability of historical sources. Later in the year the teacher wants to retest the students' sensitivity to source reliability. In a study of the Spanish-American War, the teacher presents some articles on the sinking of the battleship Maine. Some of the sources present pertinent evidence but are of dubious reliability.

Question: Using these sources of information, decide who sunk the Maine and defend your position. (Among other things the teacher will expect students to challenge the reliability of the dubious sources.)

Category_____

9. Conditions for this question: The economics class has studied the definition of primary, secondary, and terciary industries.

Question: Label each of the following as primary, secondary, or tertiary industries: (A) Fishing_____; (B) Vegetable canning _____; (C) Copper mining _____; (D) Barbering _____; (None of these examples of industries were used in the original instruction.)

Category_____

10. Conditions for this question: Students in a history course have read an article discussing how the American and French Revolutions were similar and dissimilar.

Question: Compare the American and French Revolutions.

Category_____

11. Conditions for this question: The teacher projects a political cartoon on the screen with an overhead projector. Before asking the students to describe the point which the artist is making in the cartoon, the teacher asks this question:

Question: Describe what you see in this cartoon.

Category_____

12. Conditions for this question: As an optional activity the students may answer this question.

Question: Write another verse to the Star Spangled Banner which describes the qualities of patriotism that you feel are most important.

Category_____

# APPENDIX F

## PRACTICE IN WRITING QUESTIONS AMERICAN HISTORY

EDUCATION 431

Methods and Materials in Teaching Social Studies

PRACTICE IN WRITING QUESTIONS - AMERICAN HISTORY

Please read the following information taken from an American History textbook. After you have read the information, please write a sample question for each of the four categories of the Gallagher-Aschner scale.

Our education changes to meet the demands of a changing world. The United States strengthened itself at home in other ways too. Vigorous efforts were made to improve our schools. These efforts were influenced by one event in particular. This event was the Soviet launching of Sputnik I in 1957. Sputnik I shocked Americans into wondering if the Soviet Union was ahead of the United States in training scientists and technicians, who had made Sputnik possible. Americans now took a new look at their own system of education.

Clearly, our schools had to prepare pupils for life in a changing and challenging world. Methods of teaching science and mathematics were modernized as the United States came to depend on science more and more. The machines that science and technology produce had become vital to the nation's defense.

... Congress, too, acted to help improve American education. In December 1963, Congress voted to appropriate $1.2 billion to aid the nation's colleges in building classrooms, laboratories, and libraries. This aid was greatly needed because college enrollments, already at a record high in 1963, were expected to double in number by 1970. Congress also passed another law granting funds for vocational education and for loans to college students.

Casner, Mabel B. and Ralph H. Gabriel. Story of the American Nation. New York: Harcourt, Brace & World, Inc., 1964, p. 782

# APPENDIX G

## VIDEO TAPE MODEL SCRIPT AND SYMBOLIC MODEL HANDOUT

EDUCATION 431

Methods and Materials in Teaching Social Studies

VIDEO TAPE MODEL SCRIPT
CLASSROOM QUESTIONS: DEFINITIONS,
SITUATIONS, AND EXAMPLES

The purpose of this video tape is to present a perceptual model asking sample questions in each of the four categories on the Gallagher-Aschner scale, namely, cognitive memory, convergent, divergent, and evaluative. The word question will be used to refer to any intellectual exercise that requires a response; this would include both projects and problems.

The format of the presentation will be as follows: First, a definition of the category under consideration will be presented. Second, four sample teaching situations and a question related to each will be modeled. Third, discussion of each category, situation, and example will be held as needed.

Cognitive memory. A cognitive memory question is one which requires the simple reproduction of facts, formulae, or other items of remembered content through use of such processes as recognition, rote memory, or recall.

Situation: A class in American Studies is reviewing the labor movement in the United States.

Question: Who was Samuel Gompers?

Situation: A class in World Cultures has been investigating countries in Eastern Europe.

Question: What city is the capital of Czechoslovakia?

EDUCATION 431

Methods and Materials in Teaching Social Studies

SYMBOLIC MODEL HANDOUT
CLASSROOM QUESTIONS: DEFINITIONS
SITUATIONS, AND EXAMPLES

The purpose of this handout is to present symbolic information relative to sample questions in each of the four categories on the Gallagher-Aschner scale, namely, cognitive memory, convergent, divergent, and evaluative. The word question will be used to refer to any intellectual exercise that requires a response; this would include both projects and problems.

The format of this handout is as follows: First, a definition of the category under consideration is presented. Second, four sample teaching situations and a question related to each is presented. Third, discussion of each category, situation, and example will be held as needed.

Cognitive memory. A cognitive memory question is one which requires the simple reproduction of facts, formulae, or other items of remembered content through use of such processes as recognition, rote memory, or recall.

Situation: A class in American Studies is reviewing the labor movement in the United States.

Question: Who was Samuel Gompers?

Situation: A class in World Cultures has been investigating countries in Eastern Europe.

Question: What city is the capital of Czechoslovakia?

Situation: A class in American Studies has been investigating the role of the President of the United States.

Question: List, on the chalkboard, the cabinet positions a newly elected President must fill.

Situation: A class in West Virginia Studies has been studying the role rivers have played in the historical and economical development of the state.

Question: The students are requested to label, on an outline map, the five rivers they have been discussing in class.

Convergent. A convergent question requires the analysis and integration of given or remembered data. It leads to one expected end

result or answer because of the tightly structured framework through which the individual must respond.

Situation: A class in American Studies has been studying the labor movement in the United States.

Question: Write a summation of our readings and discussions on the major benefits organized labor has brought to the working man.

Situation: Students in a World Cultures class have studied the major exports of countries in Eastern Europe.

Question: Prepare a bargraph of the five common exports of the Eastern European countries we have been studying.

Situation: Students in American Studies are studying the office of the President of the United States.

Question: Summarize from the State of the Union message what the President indicated as being his major educational proposals.

Situation: A class in West Virginia Studies has been studying internal waterways of West Virginia.

Question: Using our agreed upon color scheme, construct a map showing where our 10 largest population areas are located.

Divergent. A divergent question is designed to permit the individual freedom in generating his won data within a data poor situation. A new direction can be taken or a new perspective developed on a given topic.

Situation: Students in American Studies are continuing their study of the labor movement in the United States.

Question: If the organization of labor had been delayed for ten years, what might be the results today?

Situation: Students in a World Cultures class continue their study of countries in Eastern Europe.

Question: What might be the reasons their economies are operating as they are?

Situation: Students in an American Studies class are continuing their investigation of the office of the President of the United States.

Question: What might have happened if Barry Goldwater had been elected President of the United States in 1964?

Situation: A class in West Virginia Studies continues to investigate the internal waterways of West Virginia.

Question: What would be the political and economic consequences if all rivers in West Virginia ran East?

Evaluative. An evaluative question deals with matters of judgment, value, choice, and is characterized by its judgmental quality.

Situation: A class in American Studies is nearing the conclusion of an investigation of the labor movement in the United States.

Question: Do you think that organized labor has mis-used the strike as a labor weapon? Support your position.

Situation: Students in a World Cultures class are about to complete their studies of the countries of Eastern Europe.

Question: In international relations, which country deserves our close attention? Why?

Situation: An American Studies class is investigating the executive branch of our government.

Question: Should the Vice President of the United States be elected on the basis of his own popular vote? Support your answer.

Situation: A class in West Virginia Studies is considering problems related to internal waterways.

Question: What do you consider the best way to handle the problem of pollution of our rivers? Support your answer.

# APPENDIX H

## PRACTICE IN WRITING QUESTIONS - SOCIOLOGY

EDUCATION 431

Methods and Materials in Teaching Social Studies

PRACTICE IN WRITING QUESTIONS - SOCIOLOGY

Read the following selection and write two sample questions for each of the Gallagher-Aschner categories. If challenged on my question, you should be able to defend your position.

As a reading of history makes clear, there has usually been a more or less cyclical alternation in human societies between periods in which the rule of might held sway and others in which the rule of right was dominant to greater or lesser degree. These political "cycles," as I shall call them, each span the existence of a given political regime. Each cycle begins with the forcible seizure of power by a new elite and involves an initial phase of violence during which organized resistance is either destroyed or suppressed. The next phase is one in which the regime strives to reduce its dependence on naked force and to increase its legitimate authority. During this phase the trend toward constitutionalism, or the rule of right, may be halted or even reversed if the power of the elite is seriously challenged by forces either at home or abroad. However, unless there is a steady succession of such challenges, the long term trend involves a reduction in the active role of force and coercion and an increase in the role of persuasion and incentive until finally the cycle comes to an end when the regime is overthrown by its successor or some foreign conqueror.

To introduce the concept of cycles into our theory is not to imply that history repeats itself or that one cycle is exactly like another. Obviously cycles differ in a number of significant ways.

To begin with, cycles do not have any uniform duration. Some are very brief, as in the case of the cycle which began in Russia with the February Revolution of 1917 and ended with the October Revolution in the same year. Others extend over centuries, as in the case of the present British cycle, which dates back to the middle of the seventeenth century.

Short cycles differ considerably from those of longer duration. Because they are so brief, the process of legitimation, or constitutionalism, hardly gets started, and a new era of violence may be instituted before the last has really ended.

Even where cycles are of comparable duration, other factors inevitably influence the progress of constitutionalism, either, hindering or promoting its growth. For example, the nature of the struggles which initiate the cycle can be quite important. Other things being equal, constitutionalism develops more quickly after a prolonged and bitter war to free the nation from foreign tyranny than

after a revolution which sets brother against brother. The nature of the preceding regime or regimes is also likely to have some effect. Societies which have never developed a tradition of constitutional government move more slowly in this direction than those which have such a tradition. Also, it is logical to predict that the traditions of constitutionalism develop more quickly after a brief and limited palace revolution than after a prolonged and far-reaching social revolution.

The economic situation of a nation is also likely to affect the degree to which constitutionalism develops. One would predict that a high level of productivity and a rapid advance in the level of productivity would each be conducive to the development of constitutional government. Both provide increased opportunities for men to satisfy their desires without recourse to violence.

Taking all of the foregoing together, it may be predicted that constitutional government will be most highly developed where (1) the political cycle is of long duration, (2) the present regime was established during a war of national independence, (3) constitutional government flourished before the present cycle began, (4) there have been few, if any, serious threats to the existing regime, (5) a high level of productivity prevails, and (6) there is a period of rapid economic development. In short, the full flowering of constitutional government depends upon a peculiar combination of circumstances which have not occurred often in human history.

Other important differences in political cycles are linked with the nature of the elite which overthrew the old regime and dominated the first phase of the new cycle. Sometimes plunder and self-aggrandizement are their sole concern; these may be called "materialistic" elites. Trujillo's regime in the Dominican Republic and the Saudi dynasty in Arabia are classic examples from recent history.

In some instances, however, elites are motivated by ideals and visions of a more equitable social order. These may be called "ideological" elites. The Communist regimes which won control in Russia, Yugoslavia, and China in recent decades are examples of this type of elite.

Frequently there is some mixing of these two elements, and sometimes this mixture is highly complex. For example, a frank and honest appraisal of the American Revolution indicates that both elements were present.

Source: Gerhard E. Lenski, Power and Privilege, 1966, pp. 59-60.

# APPENDIX I

## SCHOOLS REPRESENTED IN THE STUDY

SCHOOLS REPRESENTED IN THE STUDY

| School | County | Number of Student Teachers | Size of School |
|---|---|---|---|
| Barrackville High | Marion | 1 | 240 |
| Central Junior High | Harrison | 1 | 536 |
| East Fairmont High | Marion | 3 | 1,093 |
| Fairmont Senior High | Marion | 3 | 1,241 |
| Fairview High | Marion | 1 | 281 |
| Farmington High | Marion | 3 | 478 |
| Gore Junior High | Harrison | 2 | 481 |
| Grafton Junior High | Taylor | 1 | 421 |
| Kingwood High | Preston | 1 | 652 |
| Lumberport High | Harrison | 3 | 417 |
| Mannington High | Marion | 2 | 611 |
| Miller Junior High | Marion | 1 | 585 |
| Monongah Junior High | Marion | 2 | 168 |
| Norwood Junior High | Harrison | 2 | 177 |
| Philip-Barbour High | Barbour | 2 | 906 |
| Rivesville High | Marion | 2 | 294 |
| Roosevelt Wilson High | Harrison | 1 | 583 |
| Shinnston High | Harrison | 2 | 526 |
| Victory High | Harrison | 3 | 599 |

# APPENDIX J

## STUDENT RESPONSE FORMS

STUDENT RESPONSE - ONE

This is the first of three exercises you will do for your student teacher. First, supply requested information. Second, read the textbook selection. Third, write two or more questions about the information.

Subject_____Name of Student Teacher_____

Grade Level_____ Period_____ Date_____ Your Sex_____

"Personality formation is supervised by the primary group, the intimate group that cares. Here attitudes of honesty, loyalty, and kindness are learned. The primary group is the cradle of human nature. From the family, the most intimate of primary groups, the circle widens and eventually includes secondary groups of a very impersonal sort where competition for place and position is more severe. This transition is difficult for many, particularly for those from restrictive in-groups with unique culture patterns.

Modern society is becoming to an increasing extent a world of great secondary groups into which youth must transfer on their way to adulthood. The world of secondary groups offers new challenges as well as the need for new adjustments. Transitional shock is common, particularly for those transferring from isolated culture pockets to great cities. The shock of transition is particularly great in underdeveloped areas of the world where the contrast between rural and urban life is so great.

When they leave their early primary groups, most people become a part of new primary groups. Young people marry and establish new families. Students away at school form close personal attachments. Moreover, many large organizations deliberately foster the formation of small, intimate groups within the larger secondary-group structure. These new primary relationships help offset the coldness and impersonality of modern life.

Landis, Paul H. Sociology. New York: Ginn and Company, 1964, 133.

STUDENT RESPONSE - TWO

This is the seoncd of three exercises you will do for your student teacher. First, supply the requested information. Second, read the textbook information. Third, write two or more questions about the information.

Subject_____Name of Student Teacher_____

Grade Level_____ Period_____ Date _____Your Sex_____

THE FUTURE

The judgment of Westerns on China has shifted back and forth. Matthew Ricci, a sixteenth-century Jesuit missionary, was dazzled by the rich culture and the efficient political and economic life of China. The accounts he wrote impressed the Europeans of his day with the high level of Chinese civilization. By contrast, Europeans who travelled to China in the nineteenth century wrote of the decay of the government, the corruption of officials, and the poverty and backwardness of the people. In the twentieth century prominent Chinese confirmed these unfavorable reports. One wrote in 1935 that China was "undoubtedly the most chaotic, the most misruled nation on earth, the most pathetic and most helpless, the most unable to pull herself together and forge ahead." Today, judgments on China are mixtures of admiration and anxiety.

Out of the chaos of the past century a new civilization has been born in one of the great movements of history. One-fourth of mankind has been unified, regimented, and driven to catch up with the world. Material achievements have been remarkable. A child born in China today is likely to live longer, have more to eat, and enjoy a much better education than a child born a century ago. On the other hand, the same child is bound to be cut off from the rich heritage of an ancient civilization and subject to the heavy pressures of a totalitarian government.

In the past century, the impact of Western araments, machines, and ideas caused the breakdown of old China. Today the Communists have reunified the people and built a powerful state bent on achieving a century of progress in the present decade. Yet their future is plagued by many problems. For example, the pressure of the expanding population is likely to keep the standard of living low and to slow the process of industrialization. Nevertheless, China is bound to be one of the world's major powers of the century and the world will be forced to adjust to a dynamic new China.

Stavrianos, Leften S. A Global History of Man. Boston: Allyn and Bacon, Inc., 1962, 650-651.

STUDENT RESPONSE - THREE

This is the third of three exercises you will do for your student teacher. First, supply requested information. Second, read the textbook selection. Third, write two or more questions about the information.

Subject_____ Name of Student Teacher_____

Grade Level_____ Period_____ Date_____ Your Sex_____

The Government Builds the National Road to Link New Western States With the East

In 1811, the United States government began to build a road through the Appalachian Mountains to connect the East with the western areas. This National Road, as it was called, extended from Cumberland in Maryland across southern Pennsylvania to Wheeling on the Ohio River. It was finished as far as Wheeling in 1818, and then the road was extended farther west. By 1833, it reached as far as Columbus, Ohio. Again the government ordered that it be extended. Not until 1852, when it ran as far as Vandalia, Illinois, was the road finally completed.

The National Road was the finest and most important highway of its time. Almost from the day of its opening, this road carried a flood of traffic going east and west. Over the National Road, farmers drove herds of cattle and flocks of sheep from the farms of the Western states to the markets of the East. Stagecoaches carrying both mail and passengers dashed along the highway at top speed.

Great canvas-covered Conestoga (KON-ess-TOH-gah) wagons moved slowly. These wagons got their name from the town of Conestoga in Pennsylvania, where they were first made about 1750. The strong Conestoga wagon was the "freight car" of the early 1800's.

Inns soon sprang up along the National Road to serve as stopping places for the stagecoaches. The wagon-and cattle-drivers, however, often had to sleep along the roadside.

Gasner, Mabel B. and Ralph H. Gabriel. Story of the American Nation. New York: Harcourt, Brace and World, Inc., 1964, 271-273.

# APPENDIX K

# INTER-READER AGREEMENT

INTER-READER RELIABILITY CHECKS

Reliability Check Number One — December 2, 1971

$r = \frac{x}{y}$ $\quad \frac{159 + 159 + 159}{159 + 159 + 159 + 81} = .85$

x = number of agreements

y = total number of observations

---

Reliability Check Number Two — March 23, 1972

$r = \frac{x}{y}$ $\quad \frac{96 + 96 + 96}{96 + 96 + 96 + 26} = .91$

x = number of agreements

y = total number of observations

---

Reliability Check Number Three — May 3, 1972

$r = \frac{x}{y}$ $\quad \frac{120 + 120 + 120 +}{120 + 120 + 120 + 37} = .90$

x = number of agreements

y = total number of observations

---

Reliability Check - Total

$r = \frac{x}{y}$ $\quad \frac{375 + 375 + 375}{375 + 375 + 375 + 144} = .88$

x = number of agreements

y = total number of observations

---

FIGURE 5

# APPENDIX L

EXPERIMENTAL GROUP CONTROL VARIABLES

CONTROL GROUP CONTROL VARIABLES

EXPERIMENTAL GROUP (N=18) CONTROL VARIABLES

| Subject | Age | Sex | Marital Status | Overall G.P.A. | M.T.A.I. | T.S.R.T. | D-Scale |
|---|---|---|---|---|---|---|---|
| 1 | 21 | F | S | 2.55 | 62 | 221 | 98 |
| 2 | 23 | M | S | 2.31 | 49 | 212 | 181 |
| 3 | 20 | F | M | 2.43 | 71 | 216 | 141 |
| 4 | 22 | M | S | 2.18 | 85 | 188 | 137 |
| 5 | 21 | F | S | 2.89 | 71 | 221 | 118 |
| 6 | 21 | M | S | 3.20 | 79 | 184 | 145 |
| 7 | 20 | F | S | 3.92 | 62 | 191 | 159 |
| 8 | 20 | F | S | 2.70 | 60 | 191 | 148 |
| 9 | 36 | M | M | 3.06 | 84 | 214 | 67 |
| 10 | 20 | F | S | 3.72 | 62 | 216 | 98 |
| 11 | 22 | M | S | 2.45 | 24 | 196 | 150 |
| 12 | 21 | F | M | 3.32 | 23 | 189 | 111 |
| 13 | 23 | F | S | 2.26 | 93 | 177 | 118 |
| 14 | 26 | M | M | 2.08 | 52 | 205 | 110 |
| 15 | 22 | M | S | 2.64 | 39 | 208 | 157 |
| 16 | 22 | M | M | 2.38 | 56 | 195 | 120 |
| 17 | 21 | F | S | 2.83 | 39 | 173 | 189 |
| 18 | 21 | M | S | 2.67 | 04 | 165 | 165 |

CONTROL GROUP (N=18) CONTROL VARIABLES

| Subject | Age | Sex | Marital Status | Overall G.P.A. | M.T.A.I. | T.S.R.T. | D-Scale |
|---|---|---|---|---|---|---|---|
| 1 | 21 | M | S | 2.98 | 85 | 231 | 107 |
| 2 | 21 | F | S | 2.09 | 45 | 223 | 158 |
| 3 | 21 | F | S | 2.47 | 34 | 204 | 160 |
| 4 | 25 | M | M | 2.19 | 48 | 191 | 140 |
| 5 | 21 | M | S | 2.30 | 22 | 215 | 156 |
| 6 | 25 | M | S | 2.38 | 61 | 198 | 99 |
| 7 | 21 | F | M | 2.43 | 51 | 192 | 149 |
| 8 | 26 | M | M | 2.15 | 31 | 180 | 150 |
| 9 | 21 | F | S | 2.99 | 74 | 228 | 106 |
| 10 | 22 | F | S | 2.68 | 68 | 194 | 120 |
| 11 | 21 | M | S | 3.18 | 04 | 208 | 138 |
| 12 | 21 | F | S | 2.36 | 76 | 216 | 111 |
| 13 | 21 | M | S | 2.53 | 15 | 193 | 122 |
| 14 | 24 | F | M | 3.46 | 91 | 233 | 124 |
| 15 | 25 | M | M | 3.18 | 62 | 204 | 141 |
| 16 | 22 | M | S | 2.23 | 37 | 181 | 123 |
| 17 | 20 | M | S | 2.28 | 42 | 187 | 148 |
| 18 | 21 | M | S | 3.09 | 81 | 220 | 159 |

# APPENDIX M

## EXPERIMENTAL GROUP FREQUENCY AND PROPORTIONAL DATA OF EACH QUESTIONING LEVEL FOR FIVE AUDIO TAPES

TABLE XVII
EXPERIMENTAL GROUP (N=18) FREQUENCY AND PROPORTION DATA OF EACH QUESTIONING LEVEL FOR FIVE AUDIO TAPES

| Audio Tape | Cognitive Memory Number | p* | Convergent Number | p* | Divergent Number | p* | Evaluative Number | p* | Total Cognitive Questions | Others (Unclassified) Number | p** | Totals Questions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 313 | .60 | 105 | .20 | 80 | .15 | 23 | .04 | 521 | 70 | .12 | 591 |
| 2 | 369 | .74 | 64 | .13 | 57 | .11 | 10 | .02 | 500 | 75 | .13 | 575 |
| 3 | 484 | .74 | 105 | .16 | 47 | .07 | 16 | .12 | 652 | 69 | .10 | 721 |
| 4 | 337 | .75 | 73 | .16 | 34 | .08 | 8 | .02 | 452 | 89 | .16 | 542 |
| 5 | 280 | .58 | 95 | .20 | 98 | .20 | 8 | .02 | 481 | 55 | .10 | 536 |
| Totals | 1783 | .68 | 442 | .17 | 316 | .12 | 65 | .02 | 2606 | 358 | .12 | 2964 |

*Proportion values of Cognitive Categories are computed on the basis of the total number of Cognitive questions asked.

**Proportion values of Others Category are computed on the basis of the total number of questions asked.

TABLE XVII
EXPERIMENTAL GROUP (N=18) FREQUENCY AND PROPORTION DATA OF EACH QUESTIONING LEVEL FOR FIVE AUDIO TAPES

| Audio Tape | Cognitive Memory Number | p* | Convergent Number | p* | Divergent Number | p* | Evaluative Number | p* | Total Cognitive Questions | Others (Unclassified) Number | p** | Totals Questions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 313 | .60 | 105 | .20 | 80 | .15 | 23 | .04 | 521 | 70 | .12 | 591 |
| 2 | 369 | .74 | 64 | .13 | 57 | .11 | 10 | .02 | 500 | 75 | .13 | 575 |
| 3 | 484 | .74 | 105 | .16 | 47 | .07 | 16 | .12 | 652 | 69 | .10 | 721 |
| 4 | 337 | .75 | 73 | .16 | 34 | .08 | 8 | .02 | 452 | 89 | .16 | 542 |
| 5 | 280 | .58 | 95 | .20 | 98 | .20 | 8 | .02 | 481 | 55 | .10 | 536 |
| Totals | 1783 | .68 | 442 | .17 | 316 | .12 | 65 | .02 | 2606 | 358 | .12 | 2964 |

*Proportion values of Cognitive Categories are computed on the basis of the total number of Cognitive questions asked.

**Proportion values of Others Category are computed on the basis of the total number of questions asked.

# APPENDIX N

## CONTROL GROUP FREQUENCY AND PROPORTION DATA OF EACH QUESTIONING LEVEL FOR FIVE AUDIO TAPES

TABLE XVIII
CONTROL GROUP (N=18) FREQUENCY AND PROPORTION DATA OF EACH QUESTIONING LEVEL FOR FIVE AUDIO TAPES

| Audio Tape | Cognitive Memory Number | p* | Convergent Number | p* | Divergent Number | p* | Evaluative Number | p | Total Cognitive Questions | Others (Unclassified) Number | p** | Total Questions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 280 | .60 | 86 | .18 | 88 | .19 | 12 | .03 | 466 | 30 | .06 | 496 |
| 2 | 288 | .65 | 102 | .23 | 45 | .10 | 8 | .02 | 443 | 63 | .12 | 506 |
| 3 | 251 | .63 | 51 | .13 | 84 | .21 | 10 | .03 | 396 | 18 | .04 | 414 |
| 4 | 262 | .61 | 78 | .18 | 84 | .19 | 8 | .02 | 432 | 28 | .06 | 460 |
| 5 | 229 | .54 | 78 | .18 | 96 | .23 | 19 | .05 | 422 | 27 | .06 | 449 |
| Totals | 1310 | .61 | 395 | .18 | 397 | .18 | 57 | .03 | 2159 | 166 | .07 | 2325 |

* Proportion values of Cognitive categories are computed on the basis of the total number of Cognitive questions asked.

** Proportion values of Others category are computed on the basis of the total number of questions asked.

# APPENDIX O

## EXPERIMENTAL GROUP FREQUENCY AND PROPORTION DATA OF EACH QUESTIONING LEVEL FOR THREE GROUPS OF STUDENT RESPONSES

TABLE XIX
EXPERIMENTAL GROUP (N=18) FREQUENCY AND PROPORTION DATA OF EACH QUESTIONING LEVEL FOR THREE GROUPS OF STUDENT RESPONSES

| Student Response | Cognitive Memory Number | p* | Convergent Number | p* | Divergent Number | p* | Evaluative Number | p* | Total | Others Number | p** | Total Questions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 907 | .55 | 401 | .24 | 339 | .20 | 11 | .01 | 1658 | 265 | .14 | 1923 |
| 2 | 930 | .51 | 412 | .22 | 459 | .25 | 37 | .02 | 1838 | 98 | .05 | 1936 |
| 3 | 1151 | .60 | 266 | .14 | 502 | .26 | 4 | .00 | 1923 | 67 | .03 | 1990 |
| Totals | 2988 | .55 | 1079 | .20 | 1300 | .24 | 52 | .01 | 5419 | 430 | .07 | 5849 |

* Proportion values of Cognitive categories are computed on the basis of the total number of Cognitive questions asked.

** Proportion values of Others category are computed on the basis of the total number of questions asked.

# APPENDIX P

## CONTROL GROUP FREQUENCY AND PROPORTION DATA OF EACH QUESTIONING LEVEL FOR THREE GROUPS OF STUDENT RESPONSES

TABLE XX
CONTROL GROUP (N=18) FREQUENCY AND PROPORTION DATA OF EACH QUESTIONING LEVEL FOR THREE GROUPS OF STUDENT RESPONSES

| Student Response | Cognitive Memory Number | p* | Convergent Number | p* | Divergent Number | p* | Evaluative Number | p* | Total Cognitive Questions | Others (Unclassified) Number | p** | Total Questions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 653 | .44 | 423 | .29 | 393 | .27 | 3 | .00 | 1472 | 224 | .13 | 1696 |
| 2 | 671 | .44 | 304 | .20 | 534 | .35 | 11 | .01 | 1520 | 103 | .06 | 1623 |
| 3 | 771 | .45 | 356 | .21 | 593 | .34 | 6 | .00 | 1726 | 55 | .03 | 1781 |
| Totals | 2095 | .44 | 1083 | .23 | 1520 | .32 | 20 | .00 | 4718 | 382 | .07 | 5100 |

* Proportion values of Cognitive categories are cumputed on the basis of the total number of Cognitive questions asked.

** Proportion values of Others category are computed on the basis of the total number of questions asked.